FETTERS, JANIS LYNN. The Effect of Two Different Approaches to Gymnastics Free-Exercise on Body-Image Concept and Movement Concept. (1970) Directed by: Dr. Celeste Ulrich pp. 163

The purpose of this study was to investigate the effects of two methods of teaching gymnastics free-exercise routines on the Body-Image Concept and Movement Concept of beginning gymnasts. The first method consisted of teaching optional routines by the problem-solving approach. The second method consisted of teaching a compulsory routine by the demonstration-explanation approach. Subjects were thirty college women enrolled in two sections of a beginning gymnastics class at The University of North Carolina at Greensboro.

The Q-sort technique was utilized to record and score seventy-five Body-Image Concept statements and seventy-five Movement Concept statements devised by Doudlah. The tests were administered prior to and after seven weeks of instruction. Individual correlation coefficients between the real-self and the ideal-self of Body-Image Concept and Movement Concept for both the first and second testing were calculated by means of a devised correlation nomograph. Correlation coefficients between initial and final self-sorts and between initial and final ideal-sorts of Body-Image Concept and Movement Concept were similarly obtained.

Analysis of covariance was used to determine if there was a difference in Body-Image Concept or Movement Concept between or within the classes at the beginning and at the end of the instructional period. Fisher's "t" test for significance of difference between both correlated and uncorrelated means was used to determine if there was a difference between initial and final self-sorts

and between initial and final ideal-sorts of Body-Image Concept and Movement Concept, and to determine if the classes differed in free-exercise routine competency by the end of the instructional period.

The following results were obtained:

1. There was no difference within or between classes with regard to Body-Image Concept or Movement Concept prior to, or following instruction.

2. There was a significant difference between initial and final self-sorts and between initial and final ideal-sorts of both Body-Image Concept and Movement Concept within both classes.

3. There was no difference between classes with regard to change in self-sort or ideal-sort of Body-Image Concept and Movement Concept.

4. There was no difference between classes with regard to final competencies in free-exercise routine performance.

The writer concluded the following:

1. The problem-solving approach and the demonstration-explanation approach to gymnastics free-exercise results in the subject's re-evaluation of the ideal Body-Image Concept and ideal Movement Concept and a corresponding reassessment of the real-self in relation to the changed ideal.

2. The problem-solving approach and the demonstration-explanation approach result in comparable effects on both the final competency in free-exercise performance and attitudes about one's body and its movement capacities.

THE EFFECT OF TWO DIFFERENT APPROACHES TO GYMNASTICS FREE-EXERCISE ON BODY-IMAGE CONCEPT AND MOVEMENT CONCEPT

by

Janis Lynn Fetters

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Approved by

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CHAPTER I

INTRODUCTION

Each human being is born with little awareness of "who he is." As the individual grows, he comes into contact with the environment and must interact with varying situations and numerous personalities which elicit a wide range of behaviors. As he interacts he begins to form feelings, attitudes, values, and beliefs that guide his actions and reactions and that give definition to his being.

From the moment of birth the socialization process begins to mold and shape an individual's behavior; to provide rules that define the appropriate ways to obtain his wants and needs. Each person is conditioned by societal roles and expectations. The roles he chooses, the goals to which he aspires, and the rules by which he interacts provide a structure in which he comes to know his "self"; what the words, "I" and "me", connote. His peer group, family, school and other social institutions thus give direction to his interaction and to his definition of "self" in the social milieu.

Movement is essential to interaction with others and with the environment. One's movement is not only physiologically or physically determined, but also socially based. How one moves will depend upon the opportunities and the motivation to seek competencies by participating in a variety of movement experiences.

If particular types of movement are not socially endorsed, for example, movements requiring an exhibition of great strength by the female, the individual may avoid this type of movement. Consequently, she may perceive herself as a weak individual with regard to physical strength. Thus, not only may one's actual movement be socially influenced, but also one's concept of self as a moving being may be, to a large extent, socially based.

The phrase, "You move as you are," emphasizes the concept of movement as a symbol of personality; as a reflection of an individual's self system. Physical educators, concerned with man in his environment, need to consider the implications of this relationship and should recognize the potential for the development of positive attitudes regarding the self in movement experiences.

Another integral aspect of an individual's total perception of "self" is his attitudes and feelings about his body. Much concern and anxiety may evolve from one's concept of how he "looks" and whether he meets the societal standard of an attractive body. Because an understanding and acceptance of a changing body is crucial to adolescent adjustment, physical educators have a responsibility to understand the implications of the body-image to one's total concept of self and to provide experiences to develop positive body attitudes as well as skills for effective, efficient and expressive management of a changing body.

Whether these positive attitudes toward one's movement and one's body and, consequently, one's self, are to be effected

in the classroom, gymnasium or athletic field, depend to a great extent upon the types of student-student and student-teacher interaction that is promoted.

One goal in gymnastics routine performance is to effectively synthesize skills into an aesthetically pleasing and compositionally sound routine. Therefore, when teaching routines the teacher attempts to give the student an understanding of the nature of each event in terms of the skills involved and the principles of composition that govern each event. The teacher may approach the concept of a gymnastics routine by teaching one established routine to all students or by guiding the students to create their own routines.

One may find advantages of each of these two approaches. By teaching all students one compulsory routine through the demonstration-explanation approach, the teacher may be certain that all principles of composition are applied to the routine, and may also incorporate all of those gymnastics skills that she wishes to evaluate. Because many students may be accustomed to being told exactly what to do in terms of their movement learnings, they may feel more comfortable learning an established routine than trying to create their own routine.

By guiding the students through a problem-solving approach to develop their own optional routines, the teacher may provide for individual differences since the students are given the opportunity to find success in performing routines of varying levels of difficulty. When using this approach, one rhythm is

not imposed upon all students, rather, each student may move in a rhythm that is comfortable to her. Opportunities for self-expression and creativity through movement may also occur. The tendency of a teacher to try to make her students carbon copies of herself is a factor which does not seem to enhance the expression of creative potentials. Physical educators, teaching specific sports skills and strategies, have often been accused of failing to incorporate into the lesson any opportunity for creative behavior.

When considering the appropriateness of a teaching method in physical education, one is often inclined to evaluate the method in terms of observable outcomes, that is, by the level of skill attained by the student and by the degree of understanding of the knowledges, rules and strategies of the particular activity acquired, as measured by written tests. How the teaching method affects the student's feelings and attitudes about his own body and movement is a question that is often neglected, but it is a question that physical educators should consider when judging the worth of a particular method.

Thus, it is the concern of this writer to investigate the relative effects of two methods of teaching gymnastics free-exercise, problem-solving and demonstration-explanation, on the student's concepts about her body and its capacity for movement within the total concept of self.

If it is the purpose of physical education to provide the environment, the resources, and the guidance whereby the individual

may learn about himself as he interacts with his surroundings through movement so that he may become a self-directed, socially-intelligent human being, then physical educators must concern themselves with much more than the sports skills to be taught when planning the curriculum. Man, his movement and his environment, must be studied in order to understand the full impact of the physical education experience on his total self-concept.

CHAPTER II

STATEMENT OF THE PROBLEM

It was the purpose of this study to investigate the effect of two methods of teaching gymnastics free-exercise routines upon the Body-Image Concept and Movement Concept of college women enrolled in a beginning gymnastics class.

The study was designed to determine if change in Body-Image Concept and Movement Concept occurred within the two classes from the beginning of instruction to the end, to determine if either method significantly altered a student's concept of the real-self and the ideal-self components of Body-Image Concept and Movement Concept, and to ascertain if differences between the two methods were significant.

The following definitions of teaching method have governed the instructional procedures in this study:

Problem-solving approach - the sequential presentation of movement tasks structured to permit individual decision making within the limits of the problem design.

Demonstration-explanation approach - the demonstration and explanation of specific skills and movement sequences by the instructor followed by evaluation and correction of any deviation from the predetermined movements.

CHAPTER III

REVIEW OF LITERATURE

The purpose of this study was to investigate the relative effects of two methods of teaching gymnastics free-exercise routines on the body-image concept and the movement concept of beginning gymnasts. Thus, literature was reviewed in the areas of gymnastics free-exercise, teaching methodology, self-concept, body-image concept and movement concept. Due to research evidence supporting a relationship between self-concept and the body-image concept, the writer felt the need to include a general review of the self-concept and its related components.

GYMNASTICS FREE-EXERCISE

Free-exercise is one of the four Olympic competitive events in women's gymnastics. The competitive event is a combined harmony of tumbling, dance, and transitional movements performed to music in a twelve by twelve meter area. The nature of the movement in the free-exercise routine today reflects a trend toward increased freedom and originality of gymnastics in general, greatly contrasting the highly rigid and prescribed set of exercises of the Swedish gymnastic school of the latter 1800's.

This "modern" trend originated in the 1920's when Niels Bukh of Denmark began to promote a replacement of the Swedish

and German gymnastic systems by the so-called Danish, or non-definite, system which "allowed for more freedom, rhythm, and variety." (14:5)

Although free-exercise today consists of exactness and precision in the performance of specific tumbling and dance skills, the emphasis on increased freedom and originality of movement pervades. An excellent example of this trend is evident in the change in the dance included in a free-exercise routine. Today's gymnast is no longer bound to the traditional ballet but may utilize a variety of ballet, jazz, modern, and folk dance movements. (1:27)

In competitive free-exercise there are two types of routines: the optional composition in which the "gymnast is allowed freedom to create her own sequence of movements" (14:107), within the limits of the principles of good composition, and the compulsory composition in which the specific details for each movement of the routine are stipulated. National compulsory routines at the beginning, intermediate, and advanced levels are developed every two years and are made available by a joint committee from the Division of Girls and Women's Sports of the American Association for Health, Physical Education and Recreation and the United States Gymnastics Federation. (43:74) A teacher using compulsories may wish to utilize these routines or to develop her own compulsory routine for a class.

As mentioned above, a pleasing free-exercise routine should follow certain composition principles. The literature

generally described the following basic principles: transition, repetition, variety, contrast, amplitude, balance, unity, harmony, and climax. (71:76, 10:42-43, 1:27) Interpreting the Federation of International Gymnastique Code for free-exercise composition, Bowers stated:

> The gymnast should demonstrate a great variety of skills showing flexibility, agility, balance, and strength of execution and control. Both tumbling and dance should be utilized to produce a variety of qualities of movement. The force of the movement, the choice of subsequent movements, the amount of space used, and the flow of movement can change a single skill into a totally different presentation. Tumbling may be rapid and dynamic or soft and graceful. The range of pianissimo to forte can also be found in dance skills and creative transitions.
>
> Smooth transitions from each movement to the next are a necessity. Brief pauses may then be designed to emphasize certain parts of the routine and to provide more startling contrasts for interest. A routine is exciting when the greatest variety of movement possible is utilized in contrasting executions. (1:27)
>
> The individual gymnast should have a style and attitude toward which will help her execute her selected movements in the context of a harmonious and unified routine.
>
> Each of the parts within the total routine should look natural for the gymnast. The gymnast should not look contorted or strained. Ability to perform easily with maximum amplitude and correct rhythm will aid naturalness. (1:28)
>
> . . . the routine should be balanced by the spacing of the variety of movements selected and the difficulties. . . . the design of the routine will contain alternation of both easy and difficult movements allowing the body to move with action and rest. The routine should build toward a climactic finish. . . (1:29)

TEACHING METHODOLOGY

The learning process has aroused man's curiousity since the earliest days of recorded history. Just how this process can be optimally effected has been the prevailing topic of educational literature and research.

Trends in educational method reflect the philosophic tenets of the time. The Cartesian philosophy of the mind-body dicotomy resulted in an educational system designed, on the one hand, to "train the intellect" and, on the other hand, to "train the body" through rigorous drill. As the philosophic commitment to holistic man has emerged, the methods utilized in physical education have shifted from exclusive drill and physical response to command, to a wide variety of experiences requiring an integration of the psycho-motor, cognitive and affective behavioral domains. Mosston (31) described and analyzed a "spectrum of teaching styles" or methods available to the physical educator. He identified the premises and the "operational designs" of the "Command", "Task", "Reciprocal", "Small Group", "Individual Program", "Guided Discovery", and "Problem-Solving" styles; and he discussed the implications of each style to the student's growth in four developmental channels: physical, social, emotional and intellectual.

It appears that Mosston's book is a first in the physical education literature providing a comprehensive treatment of teaching methodology.

The Traditional Demonstration-Explanation Method

The demonstration-explanation method has been referred to as the traditional approach in physical education because it has its origins in the beginning of physical education in this country and has been the most widely used method to the present day. Richardson suggested:

> When the European system of gymnastics dominated the American scene, skill patterns were predetermined and were established authoritatively through explanation, demonstration and drill. The teacher-pupil interaction was one of command-response. (93:10)

In the early twentieth century, formal gymnastics constituted the basic physical training, and the literature of the 1920's and early 1930's indicated that gymnastics was considered as a highly formalized, stylized and standardized activity requiring a set method of presentation. (7, 32) In spite of the work of such leaders as Gulick, Wood, Heatherington, Williams and Nash who opposed formal gymnastics and promoted natural activities for social and emotional objectives, the demonstration-explanation approach in teaching specific gymnastics skills and compulsory routines continues to be in wide use today. This may be explained by the emergence of increased interest in the Olympics, resulting in the trend to teach gymnastics in schools as a potential competitive event. Uphues (79:51) indicated the preference for the demonstration-explanation approach when she wrote,

> Compulsory or prescribed movements, combinations, and short routines must be presented first in order to provide the gymnast with a good comprehensive foundation in gymnastic movement. (79:51)

It is interesting to note that this view is in direct contrast to the view of proponents of "movement education" who emphasize the need for a wide variety of exploratory and discovery movement activities to provide the comprehensive foundation for specific skills and movement patterns.

Mosston (31) described the demonstration-explanation approach in reference to the "Command" style of teaching. Describing the structure of this traditional approach, he spoke of the "famous quadrivium":

> Step 1: Demonstration
> Step 2: Explanation
> Step 3: Execution
> Step 4: Evaluation (31:27)

Discussing the "Command" style, Mosston wrote:

> The important principle involved here is that the sought responses and the stimuli used to produce them are results of decisions made by the teacher. This principle is based on another fundamental assumption which undergirds the command style: the role of the student is to respond to the teacher's stimuli. Theoretically, the student should respond in all cases, in all subject matter. This is based on a traditional view of the teacher-student relationship: since the teacher possesses knowledge and is experienced, his role is to tell things to others: the role of the others is to listen, to absorb, and to comply. (31:19-21)

Although Mosston emphasized the limitations of the "Command" style and illustrated in his book the greater contributions of the problem-solving and discovery styles to optimal involvement in the physical, social, emotional and intellectual "developmental channels", he did point out the merits of demonstration. He listed these as follows:

1. It presents an holistic image of the activity.

2. It presents a visualization of the various parts of the activity and the integrative process of movement.
3. It creates a sense of admiration and can serve as strong motivation for learning.
4. It fortifies the position of the performer as an expert or an authority.
5. It can inspire a sense of the beauty of human motion.
6. It can draw the learner's attention to details that seem to be important in the activity.
7. It points to a success level. It may motivate the learner to try for his potential level of performance.
8. It may save time. Explanations often seem to be too long, too tedious, or unclear. A neat demonstration tells the whole story quickly.
9. It seems to be efficient. All that is needed is to "show and tell," and then it is left to the learner to emulate the demonstration.
10. A demonstration by a good performer can show an exact starting position in a given sport: . . . .
11. A demonstration can illustrate the desired initial movement toward a desired purpose: . . . .
12. It can show the series or sequences of movements which are employed in a given activity.
13. It can focus on the precise results of performance: . . . .
14. It can impress the learner with the smoothness, suppleness, and grace of coordinated human motion.
15. It can affect the perceptions of the learner.
16. It presents to the students the standard of what the teacher considers to be "right" or "good". (31:25-26)

Singer (35) and Cratty (11) described the demonstration and the explanation in terms of categories of sensory stimuli; the explanation being the presentation of "verbal cues" /stimuli/, and the demonstration being the presentation of "visual cues" /stimuli/ to the learner. In discussing the relative contributions of types of sensory information to motor learning, Cratty stated that

> in general, the most accurate type of sensory input when learning a motor task is visual inspection. However, for effective learning, manual guidance, visual demonstration, verbal description, as well as practice, are best combined. (11:60)

Singer (35) pointed out that skill level, task complexity, as well as age factors may determine the appropriateness and type of verbal cues given. It has been found that "beginners as a group seem to benefit less than advanced learners from extensively detailed verbal directions" and that the more "complex task requires greater explanation." (35:228)

The Problem-Solving Method

> No teaching procedure in a democratic society can be called education unless it provides for, develops, and encourages individual intellectual growth and individual decision making. Elimination of thinking, questioning, inquiry, doubt, imagination, and experimentation with un-orthodox ideas-and these are some aspects of the cognitive process-produces intellectually sterile individuals. (31:29)

As physical education objectives have changed from the purely physical to the broader physical, social, emotional, and intellectual educational objectives the problem-solving approach to motor learning has evolved. Dewey (12:36), who believed that "learning is something that the pupil has to do himself and for himself" and that "the initiative lies with the learner, the teacher being a guide and director," was one of the first promoters of the problem-solving process in the American education system. His definition and analysis of "reflective thinking" has been considered the essence of the problem-solving approach. He pointed out that reflective thinking involves the following:

> . . . (1) a state of doubt, hesitation, perplexity, mental difficulty, in which thinking originates, and (2) an act of searching, hunting, inquiring, to find

> material that will resolve the doubt, settle and dispose of the perplexity. (12:12)

He emphasized the importance of attitudes of "open-mindedness" (12:30), "whole-heartedness (absorbed interest)" (12:31), and "responsibility in facing consequences" (12:32) as integral to the success of problem-solving.

Dewey's five phases of reflective thought: "(1) Suggestion, (2) Intellectualization, (3) Guiding Idea, (4) Reasoning, and (5) Testing Hypotheses by Action" (12:107) have served as general guides to the structure of the problem-solving process in the classroom. Dewey made direct reference to the implications of this process of reflective thought to physical education when he wrote, "Mastery of the body is an intellectual problem. . . the development of physical control is not a physical, but an intellectual achievement." (12:206)

Broer advocated the use of the problem-solving method in physical education when she wrote:

> The 'do it this way' method ignores the fact that learning is an active process; that learning takes place as insight dawns - and this is as true of learning a motor skill as it is of any other learning. For effective learning, the student must be involved beyond simply going through a movement described and demonstrated by the teacher. He needs to be involved in considering the possibilities and deciding which movements have the greatest possibility for the best results according to his purpose. (5:365)

Following Dewey's steps or phases of reflective thought, Kozman, Cassidy, and Jackson described the steps in problem-solving in physical education as follows:

1. A felt difficulty defined
2. Seeking information about alternative solution

3. Selecting a solution to be tried
4. Deciding what to do to move toward solution
5. Acting to solve problem
6. Resolution of problem or another solution tried. (27:37)

Brown and Cassidy (6) generally described the same steps. Equating the problem-solving method with the "democratic method", they described those conditions in which the problem-solving process can take place and which provide guidelines for each step in the process: a climate of accepting differences, encouraging independent problem-solving and creative work, respecting each individual, allowing pride to show itself without threat, and promoting success and comfortableness in giving of self. (6:113)

Burton (8), describing the tendency of "mental rigidity" in problem-solving, emphasized the importance of the environment in the problem-solving process. He wrote:

> The most useful technique [to lower rigidity] is to recognize that emotional stress heightens rigidity. The development of a favorable emotional climate in the classroom through regard for the principles of mental hygiene probably will be as helpful as anything. Frustration, anxiety, and discouragement should be avoided. (8:251)

Hinton (63:217), conducting a study with graduate students using three tests which tapped four separate factors of intellectual ability believed to be basic to creativity, found support to conclude that "environmental frustration does significantly reduce creative problem-solving performance."

In addition to a conducive climate the nature and structure of the actual problems must be considered. Mosston (31),

who has written what is perhaps the most comprehensive explanation of the problem-solving approach in physical education, discussed the essential nature and structure of problems for effective problem-solving. He stated that "all problems presented to students must be relevant." (31:188) Mosston defined the three levels of relevancy as follows:

1. Problems relevant to the subject matter
2. Problems relevant to the readiness and experience of the group
3. Problems relevant to the readiness and experience of the individual. (31:189)

Mosston emphasized that the process of problem design must encompass a consideration of the "hierarchy of the structure of subject matter." (31:197) He presented the structure of subject matter in the following manner:

> This concept /of the hierarchy/ relates the given conditions /medium, equipment, number of participants/ (Level 1) which must exist as a premise of an activity to the product, to the result - the activity itself as we know it (Level 4). Levels 2 and 3 are manipulative levels which include the body and its possibilities through any matrix of movement (Level 2) to produce the six categories of what can be discovered in the activity: facts, relationships, preferences and validity, limits, concepts and variations (Level 3).
>
> Levels 1, 2, and 3 interact in a very particular way, which is guided and modified by imposed limitations - physiological, psychological, and cultural - in order to produce the unique thing which we identify as activity X /Level 4/. (31:196-197)

This concept of a hierarchial structure applied to subject matter may furnish one of the most meaningful guides to problem design in the current literature.

Burton (8:21) described the requirements of the actual problem if the problem-solving process is to be beneficial. He

wrote that "the problem must be understandable to the learner, hence; susceptible to intelligent attack, and must motivate him to want to solve it."

If the problems are appropriately designed they should serve as guides to direct the student through the reflective thought process. Although most of the literature defined certain steps in the problem-solving process, it also revealed that this process is not a definite one, two, three step-by-step procedure. Bruner (44:29), after summarizing the reflective thinking in problem solving in terms of three general points, emphasized that "the three points are not steps in any sense. The process is unified and continuous." Hodnett (20:194) spoke of the "unpredictable sequence of steps." Dewey (12) pointed out that his five phases of reflective thinking should not be considered in terms of a fixed sequence. Hermanowicz (62:27) emphasized the danger of the problem-solving process becoming a rigid orthodox procedure in the educational system, and he warned that a "mechanized application" of problem-solving can become "a thought inhibiting rather than a thought provoking device; whereas problem-solving should help develop originality and diversity in student thinking." He cited evidence which suggests that inflexibility toward attacking and solving problems may result when students learn to follow one procedure to solve a variety of problems. Frymier (16:170), describing the method of problem-solving as the "method of intelligence," pointed out that it is "a way of describing what

thoughtful people have in common, not what they do in particular," and added that problem-solving "does not provide an adequate set of rules for the operation of scholars with particular fields." Burton (8:23) spoke of a "subjectivity" as well as "objectivity" of the problem-solving process and defined the process as a "functional interaction between the two."

The idea that a defined sequence of steps is not followed in all problem-solving raises the question of whether problem-solving ability can be learned, and much of the research and literature is addressed to this topic. Burack (45) indicated that very little experimental evidence is available to suggest that specific methods of problem-solving can be taught to problem solvers. When describing the limitations of generally accepted methods of problem-solving, he indicated that "the possible use of a particular method depends upon the kind of task involved," (45:135) and that "no acceptable classification of problems exists whereby we might suggest using certain methods for some problems and other methods for other problems." (45:138)

In spite of the above observations, the literature does suggest that through continual involvement with a variety of problem-solving situations the individual might better "learn to think" in problem-solving situations. Bruner wrote:

> It is my hunch that it is only through the exercise of problem solving and the effort of discovery that one learns the working heuristic of discovery, and the more one has practice, the more likely is one to generalize what one has learned into a style of problem solving or inquiry that serves for any kind of task one may encounter - or almost any kind of task.

> I have never seen anybody improve in the art and technique of inquiry by any means other than engaging in inquiry. (44:31)

Mosston (31:x) spoke of developing "powers of cognition" by "artfully manipulating the quality of decisions we ask of people, and by increasing the complexity of the situations in which we place them." He indicated that the cognitive process is developed under the guidance of those "teaching styles which help the student go beyond the cognitive barrier;" those which "evoke the discovery capabilities of the student and strengthen his problem-solving abilities." (8:31)

Harlow (19:127) suggested that one "learns to think" by the solving of increasingly difficult problems in which he develops "organized patterns of responses that meet the demands" of a particular type of situation. He called these patterns "learning sets" and suggested that "eventually the individual may organize simple learning sets into more complex patterns of learning sets, which in turn are available for transfer as units to new situations." Summarizing his research, Harlow indicated:

> Animals, human and subhuman, must <u>learn</u> to think. Thinking does not develop spontaneously as an expression of innate abilities; it is the end result of a long learning process. (19:128)

Another area of problem-solving research involves the investigation of retention and transfer. Generally, two types of studies in this area have been conducted; those investigating the extent of transfer of certain principles or laws to the problem-solving situation, and those investigating the relative

effects of the problem-solving approach and other approaches on learning, retention, and transfer of knowledges and principles to other situations.

Burack (45) investigated the effect of knowledge of the principle of centrifugal force on the solution of a mechanical puzzle. He concluded that application to the problem-solving situation does not necessarily follow knowledge of a principle.

Corman (50) investigated the effect of varying amounts and kinds of information as guidance in problem-solving. He hypothesized that "performance would improve as the amount of information given as guidance about method of solution or principle for solution was increased." (50:19) Twelfth grade students, above and below average in mental ability, were given match tasks with varying amounts of verbal information about the principle and the method of solving the tasks. Success was appraised in terms of the number of instructional tasks solved, in the transfer to simpler and complex problems, and in verbalizing the principle. From his findings Corman concluded the following:

> . . . (a) information used in guidance must be appropriate to the task set for the student, (b) some appropriate guidance is beneficial but failure to provide it will delay rather than prevent solution, (c) the effectiveness of guidance does not depend solely on the amount of information imparted, but (d) more explicit instruction will prove most helpful with the more able students while (e) less explicit instruction may be just as effective as more directive guidance for the less able students. (50:20)

Ray (73) investigated the effects of "directed discovery" problem-solving situations compared with the traditional

direct and detailed instruction on the initial learning, retention, and transfer of micrometer measurement skills and principles. He used three levels of intelligence and found that the two methods were equally effective with regard to initial learning and short term retention, one week, but that "directed discovery" method resulted in significantly greater long term retention, six weeks, and was

> more effective than the direct and detailed approach in enabling pupils to make wide applications of material learned to new and related situations, both at one and six weeks after instruction. (73:280)

Mosston (31:226) suggested that "the wider the experience of the individual in problem solving in one area of activity, the greater the chances of transfer to other areas," and explained that "the transfer here refers to the emotional and cognitive dimension upon which physical responses so often depend."

After reviewing the literature with regard to transfer, Guthrie (17:226) indicated that "empirical evidence concerning techniques for producing transfer is inconclusive," and that "consequently, the. . . proposition that discovery learning facilitates transfer remains virtually untested."

Research comparing the relative effects of group and individual problem-solving has resulted in conflicting data. Hudgins (64:37), after reviewing the literature in this area, indicated that "groups furnish more correct solutions to problems than comparable subjects do working as individuals."

In a later study, Rotter and Stephen (74:338), on the other hand, wrote of a "generally reported superiority of individual over group conditions in problem-solving." They found that individual problem-solving was superior to combined individual and group problem-solving which was superior to just group problem-solving. They concluded that "in general, the production of ideas appears to be simply related to the proportion of time spent working alone." (74:335)

The above conflicting reports indicate that further research should be undertaken to investigate the relationship of group and individual efforts on problem-solving, and that behavioral efforts may strongly influence the problem-solving situation.

When discussing perceptual aspects of the problem-solving situation, Gaier pointed out:

> Personality, values, needs, interests, past experience and coercive aspects of the stimulus or class situation, as well as unconscious processes, have all been shown capable of affecting the direction of attention and consequently, to some degree of controlling what the individual perceives. (58:140)

He further remarked:

> Many problem solving procedures remain ineffective and represent wasted time until the teacher learns how to adapt them, not only to the varied intellectual abilities of students, but also to the varied sets and needs of the group. (58:140)

The problem-solving approach does involve planning and direction from the teacher. Richardson emphasized this point

when she quoted Craig as follows:

> The greater effectiveness of directing the attention of students to the logical or causal connection between the elements of a problem suggest that the discovery process is far from unstructured and that much frustrating and fruitless exploration can be avoided by the judicious presentation of cogent information in the form of leading questions or actual statements of fact. (93:161)

Bloom (42) offered guidance to the teacher employing the problem-solving approach when he described some of the difficulties which were exhibited by students who generally earned grades of "D" and "F" in contrast to those students who generally earned "A" and "B" grades in such fields as social sciences, humanities, biological sciences, physical sciences, and mathematics. His conclusions should also be considered by the physical educator. He found that the major difficulties were in the areas of (a) understanding the nature of the problem (42:46), (b) attitude toward the problems in terms of little confidence in ability to solve the problems (42:47), (c) understanding of ideas contained in the problem (42:47), and (d) general approach to the solution of problems, consisting of aimless drifting. (42:48)

Mosston (31:8) emphasized the importance of the teacher giving direction to the problem-solving process by analyzing the subject matter and identifying and designing the problems in such a way that they will "evoke the discovery capabilities of the student and strengthen his problem-solving abilities."

Research specifically in the area of physical education with respect to problem-solving is rather limited, and it is

mainly confined to studies concerning the effects of the method on skill attainment and attitude in a few selected activities.

Garland (97) examined the relative effectiveness of the problem-solving approach and the traditional approach on the learning of swimming. Although she found no significant difference in skill development between the groups taught by the two different methods, she did conclude that problem-solving was superior to the traditional approach in the area of self-direction and motivation.

La Plante (88) conducted a similar study in teaching bowling. She also found no significant difference between the groups taught by the problem-solving and the traditional methods in terms of skill development. Her findings agreed with Garland's in terms of the favorability of the problem-solving method in promoting interest and response as measured by replies to a questionnaire.

In the area of Gymnastics, Zeigler (105) studied the effect of the problem-solving and traditional methods on skill performance. Evaluating the subjects on a creative movement composition in terms of skill and quality of movement, and on four new stunts on the basis of competitive standards, Zeigler found no difference between the two groups in performance of the creative movement composition, but she noted that in the performance of a new stunt the traditional group seemed to show greater ability after one demonstration than the problem-solving group. She concluded that the problem-solving method did

not result in a more highly developed quality of movement; that the ability to perceive and perform the movements necessary to complete a task was not more evident through problem-solving; and that informal methodology facilitated the mastery of more difficult movements. (93:19)

Educational research does not support the overall superiority of one particular teaching method to any other. Singer wrote:

> From an educational point of view, a problem-solving approach certainly is consistent with the philosophy of our leading physical educators. From a skill-learning point of view, arguments can be justified for either method. Perhaps, to be considered at the onset, is the nature of the skill, its relation to other material to be taught, and the objectives of the teacher. (35:225)

SELF-CONCEPT

The self-concept has been defined in the literature in a variety of ways. Brownfain wrote:

> The individual. . . has many selves. The individual might, for example, conceiver of the self that he really believed he is, the self he realistically aspires to be, the self which he believes is perceived by others, the self he hopes he is now, and the self he fears he is now. The self-concept is a configuration of these and of other possible self-definitions and the stability of the self-concept derives from the interrelations among these various ways of defining the self. (18:269-270)

Kinch (67:481) defined the self-concept as "that organization of qualities that the individual attributes to himself." He referred to the word "qualities" to include "both attributes that the individual might express in terms of adjectives

(ambitious, intelligent) and also the roles he sees himself in (father, doctor, etc.)."

Kenyon (85:38) quoted Ajuriarguerra, saying that "'self-concept' or self-esteem' is a highly complex aspect of the personality," and that "it has both cognitive, i.e., . . . , 'self-awareness' or 'self-knowledge', and affective components, i.e., 'self-esteem' or 'self-regard'."

Combs and Snygg provided a phenemenological definition of the self-concept when they wrote:

> By concepts of self we mean those more or less discrete perceptions of self which the individual regards as part, or characteristic, of his being. They include all perceptions the individual has differentiated as descriptive of the self he calls I or me. (9:124)

Perkins (18) emphasized the importance of social influences in the development of the self-concept, defining the self-concept in the following manner:

> His /the individual's/ perceptions of himself in many situations together with the objects, people, ideas and values which he views as part or characteristic of himself constitute his self-concept. This self-concept emerged through the process of taking over the responses of others toward himself and incorporating these into his perceptions of himself. People with whom the child interacts - parents, siblings, teachers, and peers - exert a pervasive influence on formation and change of the self-concept. (18:450)

Two schools of theorists of the self-concept are evident in the literature; the phenomenologists, who emphasize the conscious self-concept and who define it as basically a perceptual phenomenon, and the non-phenomenologists, who's investigation is concerned with the unconscious self-concept.

Moustakas (18:205) described these two points of view, explaining that the phenomenal self is constituted by "those characteristics which a person is able to clearly recognize as a part of his make-up," and that the unconscious self is constituted by "those facets of a person's make-up which influence his ideas and attitudes pertaining to himself" but which are "not consciously recognized" by him.

These two schools have defined the self-concept, its development, and its relation to behavior and have developed measurement techniques according to either the "conscious" or "unconscious" frame of reference. Consequently, there is much disagreement between these two theoretical schools evident in the literature.

Wylie (41:3), presenting a comprehensive review of literature concerning the self-concept, reported that the "theories are in many ways ambiguous, incomplete, and overlapping," and that "no one theory has received a large amount of systematic empirical exploration."

Because of the numerous definitions, measurement of the self-concept has been conducted with a wide variety of instruments, the phenomenologists measuring the self-concept in terms of self-report type of instruments and the non-phenomenologists utilizing techniques which supposedly tap the "unconscious" self-concept. Wylie described these measurement instruments and their apparent limitations. She pointed out that the phenomenologists commonly study aspects such as "self-satisfaction, self-

acceptance, self-esteem, self-favorability, congruence between self and ideal self, and discrepancies between self and ideal self. . ." (41:40), and that they use a variety of "Q-sorts" (41:40), "Rating Scales, Questionnaires, Adjective Checklists" (41:65), and "Coding Plans for Interview Materials" (41:107) to measure these aspects.

Reviewing the non-phenomenological measurements of the self-concept, Wiley described the use of

> TAT and other picture-judging and story-telling techniques, Rorschach scores (excluding Fisher's Body-Image Index), and various indices which have been used mainly by Fisher and his associates to index Body-Image. (41:251)

Fisher's measurement techniques will be considered later in relation to body-image concept.

Because the present study is based on phenomenological measurements of body-image concept and movement concept, Wylie's discussion of the problems inherent in measurement of phenomenal constructs of the self-concept is most pertinent to this discussion. She wrote:

> We would like to assume that S's self-report responses are determined by his phenomenal field. However, we know that it would be naive to take this for granted, since it is obvious that such responses may also be influenced by (a) S's intent to select what he wishes to reveal to the E experimenter; (b) S's intent to say that he has attitudes or perceptions which he does not have; (c) S's response habits, particularly those involving introspection and the use of language; (d) a host of situational and methodological factors which may not only induce variations in (a), (b), and (c), but may exert other more superficial influences on the responses obtained. (41:24)

Jersild pointed out that what a person reports about himself depends upon certain factors:

1. What he is consciously able to recognize
2. What he not only recognizes but also is willing to admit
3. What he feels impelled to deny
4. What he feels impelled to claim about himself. (18:204)

As evident in the definitions of the self-concept, one can observe that much of the literature today does seem to support the interactionists' point of view that the self-concept, its nature and development, is greatly influenced by social forces as well as psychic factors, conscious or unconscious. Jersild (18:203) spoke of the "self-system having its origins in interpersonal relationships" and being influenced by "reflected appraisals." Mead (22:11) described the self as "essentially a social structure that arises in social experiences," and he stated that "it is impossible to conceive of a self arising outside of social experience." (22:12)

Development of the self-concept has been considered as a "process of differentiation" in which the child "explores the boundaries of his person and his environment" (18:197) to eventually become aware of himself as a distinct individual in the following ways:

> . . . through the discovery of himself as a performer. . . able to produce effects by his own actions.
>
> . . . through the development of an awareness of his body, its physical properties and appearance. (18:198)
>
> . . . through self-assertion and comparison of self with others. (18:201)

> . . . through the awareness of self as belonging to a particular ethnic or social group. (18:202)
>
> . . . through the influence of others' judgments and attitudes toward himself.
>
> . . . through the comparison of himself with an 'ideal self'. (18:204)

Havighurst (18) stressed the importance of this "ideal self", self as one would like to be, in the development of the self-concept. He stated that "the social psychologists think of the ideal self as a name for the integrated set of roles and aspirations which direct the individual's life," (18:227) and that they believe that these roles and attitudes are "deeply influenced by association with people who are in positions of prestige." (18:238)

Havighurst (18) conducted a study on the development of the ideal self as revealed by self-reports of boys and girls during childhood and adolescence. He concluded from the data that there seemed to be a developmental trend in the ideal self:

> The ideal self commences in childhood as an identification with a parental figure, moves during middle childhood and early adolescence through a stage of romanticism and glamour, and culminates in late adolescence as a composite of desirable characteristics which may be symbolized by an attractive, visible young adult, or may be simply an imaginary figure. (18:237)

The data of the above study was collected in 1946. Therefore, the extent to which the conclusions are representative of today's young people could be questioned. Mead (70:23), discussing the prevalence of youth revolt throughout the world, proposed that we are entering into a culture in which youth

find their ideal models neither in their elders nor in their peers. She described this as the "prefigurative culture" and explained that "it is not only that parents are no longer guides, but that there are no guides. . . ." (70:23) She further suggested that

> in this new culture it will be the unborn child already conceived but still in the womb - not the parent and grandparent - that represents what is to come. (70:113)

To understand just how one's ideal self-concept originates and develops will require much more extensive research, and it would seem that any conclusions that are made will be applicable only in terms of the era in which the data are collected.

Literature concerning the stability of the self-concept reveals that along with the process of establishing a self, there is the effort to maintain it. "The individual strives to be himself, to live in accordance with concepts or attitudes regarding himself, whether these be true or false." (22:19) Engle quoted Lecky as follows:

> It is generally believed that one achieves a rather high degree of organization during the course of development and comes to resist change once self-differentiation and self-definition have taken place. (18:338)

Psychologists have investigated the relationship of stability of self-concept to acceptance and adjustment. Although Wylie (41) pointed out that there has been much ambiguity in defining these terms and disagreement as to how to measure them, the research that has been conducted seems to point to a relationship between stability of self-concept and self acceptance and adjustment.

Engel (18), conducting a longitudinal study with 104 eighth graders and 68 tenth graders, administered Q-sort items to measure self-concept and the MMPI and teacher and peer group ratings to measure adjustment. Administering the tests in 1954 and again in 1956, Engle found that subjects whose self-concepts were negative at the first testing were significantly less stable in self-concept than subjects whose self-concepts were positive, and that subjects who persisted in negative self-concepts over the two year period gave evidence of significantly more maladjustment than subjects who persisted in a positive self-concept, when maladjustment was measured by scores of the MMPI. (18:346)

Brownfain (18:286) conducted a study with college males and concluded that those with a more stable self-concept in his study had a higher level of self-esteem as manifested by a higher mean self-rating and also by a higher self-rating on an inventory item defining self-acceptance, were freer of inferiority feeling and nervousness as measured by the Guilford-Martin Inventory of Factors, GAMIN, were better liked and considered more popular by the group, saw themselves more as they believed other people saw them, displayed more active social participation, and showed less evidence of compensatory behavior of a defensive kind.

Rogers stated:

> It would appear that when all of the ways in which the individual perceives himself - all perceptions of the qualities, abilities, impulses, and attitudes of the person, and all perceptions of himself in relation

> to others - are accepted into the organized conscious concept of the self, then this achievement is accompanied by feelings of comfort and freedom from tension which are experienced as psychological adjustment. (18:270)

Wylie, after reviewing the literature concerning self-concept and adjustment, reported that in most studies "positive correlations are typically obtained between level of self-regard and degree of self-reported adjustment." (41:233)

Research has also been completed to investigate the relation of self-concept to success and failure. Wylie (41:184) stated that these studies are based on the assumption that "the level of self-regard is learned through a combination of rewards and punishments for one's actions and self characteristics" and that the person "learns some things about himself through success or failure in manipulating the physical environment, and some things from the reactions of others to him."

It has been found that subjects will change their self-evaluations after experimentally induced success or failure under certain conditions. (41:198) Wylie (41:198) pointed out that the changes in self-evaluation are in terms of the specific characteristic or task being evaluated rather than in terms of "global self-regard."

Because of the premium often placed upon physical activity in adolescence, the relation of success and failure to the self-concept may have great implications to physical education. Jersild pointed out:

> . . . a person's ideas as to whether he makes a good showing when compared with others in one or more of our common athletic activities or in skills that have a somewhat 'upper class' reputation (such as horsemanship, skiing, and golfing) play an important part in the positive self-evaluation of many young people in the late high school and college years. (22:78)

The effect of self-concept on performance was investigated by Brookover, Thomas and Paterson. (18) Using seventh grade students in an urban school system, they found a significant positive correlation between self-concept and performance in the academic role. Concurring with Wylie, they pointed out that there are "specific self-concepts of ability" which differ from the "general self-concept of ability." (18:484) They further concluded that self-concept is significantly and positively correlated with the "perceived evaluations that significant others hold of the student" (18:484), and suggested that further research is needed to investigate the relationship of self-concept and performance and the possibility of enhancing the self-concept by evaluations of others. Changing the performance of individuals through the changes in self-concept would have great practical implications for the operations of educational programs.

Sex differences in self-concept have been studied by numerous investigators. McKee and Sherriffs (18) used 100 unmarried college men and 100 unmarried college women to investigate male-female conceptions in terms of (a) how they would really like to be, "Ideal-Self"; (b) how they really are, "Real Self"; (c) how they would ideally like the opposite sex to be, "Ideal Member of Other Sex"; and (d) how they believe the opposite

sex would ideally like them to be, "Belief". The subjects checked adjectives on Sarbin's Adjective Check List. In terms of "Real Self" description the investigators found that women "are more exclusively feminine than men are exclusively masculine" (18:295), that is women check those adjectives that have been culturally defined as "feminine" on the Sarbin's Adjective Check List. With respect to the "Ideal Self" the investigators noted the following:

> Women do desire allegedly male characteristics more than men desire allegedly female characteristics. (18:295)

> Women, when describing the Ideal Man, select favorable female characteristics as often as they select favorable male characteristics. (18:296)

> Men, when describing their Ideal Woman, include favorable male characteristics considerably less often than they include favorable female characteristics, . . . but men are less restrictive than women believe them to be. (18:297)

McKee and Sherriffs interpreted the discrepancy which they found between college women's ideals for themselves, "Ideal Self", and the way they describe themselves as they really are, "Real Self", as reflecting the

> dual training of American daughters; preparation to meet economic exigencies and the responsibilities to modern life (emphasized in the Ideal Self) and training to be feminine in the tradition of the female stereotype (emphasized in the Real Self). (18:297)

If one agrees with the social theorists that the self-concept is largely a social phenomenon, the implications of the above finding are quite evident.

Wylie (41), summarized the literature concerning self-concept and sex differences and concluded that college subjects hold stereotypes of real and ideal male and female persons; and that the stereotype concerning the male is more favorable than that concerning the female, but that

> this trend toward females' endorsement of the unfavorable stereotype tends to be an attitude about women in general, rather than about themselves as individuals. (41:147)

Research specifically designed to investigate the self-concept in the area of physical education has dealt mainly with the relation of certain aspects of the self-concept to motor ability. Other research investigating the relationship between self-concept and body-image concept or movement concept has also been conducted and will be described later in the following two sections.

Parker (92) examined the relationship between motor ability and self-concept of women physical education major students and non-physical education major students. Based on the Scott 3-Item Motor Ability Battery, she classified the non-physical education major students into three groups of high, middle, and low motor ability and grouped the physical education majors in a fourth group classified as high motor ability. Using a "Who Am I" 20 Statements test to measure self-concept, Parker concluded that there was no relationship between motor ability and self-concept.

Nelson (91) conducted a study investigating the relation between the self-concept and motor ability of eighty eighth grade

girls after a seven week unit in basketball. Administering the Scott Motor Ability Battery and a revision of seventy-five Q-sort statements, used by Doodlah (85), to measure self-concept before and after the seven week unit, Nelson found no statistical support for the assumption that there are differences between motor ability groups in concepts of self following a unit of basketball and found no significant relationship between motor ability scores and self-concept scores.

The literature and completed research lend support to the need for further study of the nature and development of the self-concept and its relation to behavior. Jersild (22) suggested that the self-concept should furnish a "unifying principle" for our educational programs. He wrote that "the self-concept offers teachers a principle which integrates the basic features of their task and all the little details that go into it." (22:103) Referring to the perceptual aspects of the self-concept, Combs and Snygg emphasized:

> The task of teachers, parents, writers, and anyone else whose task is affecting the behavior of others is a problem of perception. To change behavior it is necessary to help people change the way they see themselves and the world they live in. (9:58)

BODY-IMAGE CONCEPT

The body-image has been defined variously as "the attitudinal framework which defines the individual's long-term concept of his body and also influences his perception of it" (84:1); "a

dispositional system of mobility perpetually built up by ever newly incoming activity" (38:6); "a systematic impression an individual has of his body, cognitive and affective, conscious and unconscious, formed in the course of growing up;" (40:23)

> . . . a term which refers to the body as a psychological experience, and focuses on the individual's feelings and attitudes toward his body and is concerned with the individual's subjective experiences with his body and the manner in which he has organized these experiences; (15:x)

and finally,

> . . . a device for articulating body space and integrating the various affective-motor-perceptual-imaginal operations which build the body space; . . . a device which mediates between the concrete tangible body and the abstract self-concept, between the visual tangible environment and the abstractly elusive self. (38:7)

As is evident in the above definitions the body-image has been considered the resultant of both unconscious factors and perceptual factors. Concerning the latter, Wapner and Werner discussed two characteristics that distinguish the perception of one's body:

> First, the body as a perceptual object is unique in that it is simultaneously that which is perceived and also that which is perceived and also a part of the perceiver.
>
> Secondly, an unusually intense level of ego involvement is evoked by one's body as an object of perception. (38:49)

The term body-image has been referred to in the literature as "body concept" (38), "body schema" (33), "body percept" (38), and "postural model." (38)

The body-image has been studied most frequently by neurologists, psychiatrists and psychologists, who have examined it with both clinical and normal subjects, attempting to explain the origins and development of one's attitudes and concepts of his body and the relationship of these body attitudes to one's psychological functioning and behavior.

Wapner and Werner (38:26) described the development of the "body concept" as a "formation concurrent with psychological growth" and an "achievement of differentiation that is a manifestation of the child's general progress toward psychological differentiation."

Schilder (33:112) suggested that the development of one's body-image is largely dependent upon his movement as a "uniting factor." He stated that

> by movement we come into a definite relation to the outside world and to objects, and only in contact with this outside world are we able to correlate the diverse impressions concerning our own body. (33:112-113)

The literature supports the idea that the body-image is a gradually developing, subjective phenomenon. Head (15:5), one of the first neurologists who investigated the body-image, wrote that "each individual gradually constructs a picture or model of himself." Fisher and Cleveland pointed out:

> . . . it /body-image/ is usually described as evolving gradually in the course of a learning process in which the individual experiences his body in manifold situations and also the varied reactions of others to it. (15:51)

Their statement suggests that the body-image concept, as the

self-concept, is considered a socially as well as a psychically determined phenomenon and that it is to a considerable degree formed by one's interactions with others. Fisher and Cleveland suggested that the way one experiences his body is a "function of his family experiences and social milieu," (15:110) and explained that the body-image will be inadequately developed to the extent that interactions with others are faulty. (15:16) They discussed numerous categories of "body-image distortions" in terms of the individual's social interactions. These distortions will be described later in this section.

Schilder emphasized this sociological influence on body-image development when he wrote that "body-images are never isolated" (33:240) and that "there is from the beginning a very close connection between the body-image of ourselves and the body-image of others." (33:235) Likewise, Jourard (23:97) speaks of the body-image being "built in as a consequence of socialization experiences."

A wide variety of techniques have been utilized to measure the body-image. These techniques have evolved from an attempt to first analyze the body-image into particular "dimensions" and then to measure these dimensions. Vincent and Dorsey suggested the existence of three "unifying dimensions of the body-image":

> 1. Sensory-spatial dimension - Those perceptions concerning body conformation, spatial position, etc., may be conceived as being interrelated, and thus constituting one dimension of body image.

> 2. Existential dimension - Those perceptions pertaining to the substantiveness, realness, and vulnerability of the body.
>
> 3. Valuative dimension - Those perceptions concerning the value of the body's appearance and functions. (80:1105)

After reviewing the literature, Wapner and Werner cited studies which attempt to measure the following dimensions:

> . . . body anxiety, body dissatisfaction, concept of body size, plasticity of body scheme, position of body in space, preferred body proportions, differentiation of values assigned to right and left body sides, and gender designations of a various body regions. (38:50)

In addition, Fisher and Cleveland (15) have completed extensive research attempting to measure another dimension, "Body-Image Boundary." The specific measuring tools utilized have thus ranged from conscious self report inventories to such instruments as

> word association, drawings, distorted mirrors, response to ink blots, aneseikonic lenses, size estimation tasks, and tachistocopically presented pictures of distorted bodies. . . . (15:50)

Thus, one can see that at the present time, there is no one overall measure of body-image that is accepted. Vincent and Dorsey (79:1106) suggested that "as the body image phenomenon may exist on a continuum of awareness, it seems appropriate to investigate a variety of measurement rationales."

Witkin (40), postulating a relationship between one's body-image and one's perceptual functioning, designed a battery of perceptual task, such as the "rod-frame test" (40:25) and "tilting-room-tilting-chair test" (40:27), to evaluate the

subject's ability to maintain spatial orientation in a variety of situations in which cues regarding body positioning in space had been distorted. He found that subjects differed to the extent that they were "field-dependent", dependent upon visual cues for spatial orientation, or "field-independent", basing one's orientation on kinesthetic cues. Machover (40:27) then rated figure drawings of these "field-dependent" and "field-independent" subjects and found a significant correlation between low evaluation of one's body and "field-dependence," and between high evaluation of one's body and "field-independence."

One of the most penetrating investigations of the body-image has been conducted by Fisher and Cleveland (15) who introduced and attempted to measure "Body-Image Boundaries." They proposed that a fundamental dimension of the body-image involves the manner in which an individual views his body boundaries. (15:62) According to Fisher and Cleveland, individuals vary greatly in the way they view their body boundaries, that is, the "degree of firmness and definiteness" they attribute to their physical boundaries. One may view his body as "clearly and sharply bounded, with a high degree of differentiation from non-self objects," or he may regard his body as "lacking demarcation from what is 'out there'." (15:62)

To measure the body-image boundaries, Fisher and Cleveland developed a system to evaluate Rorschach ink blot responses in

terms of the subject's concern with his body boundaries. They categorized all responses into "Barrier Responses" and "Penetration of Boundary Responses." (15:58) All responses which suggested "weakness", "vagueness", or "penetrability" of the boundaries were categorized as "Penetration Responses." (15:58) Fisher and Cleveland wrote:

> It was considered that a score based on Barrier responses would tap the boundary dimension at a level of positive assertion of boundary definiteness. A score derived from Penetration of Boundary responses was perceived as getting at sensations of boundary breakdown and fragility. (15:58)

Thus, one's body-image boundaries could be described according to his "Barrier" and "Penetration" scores.

Fisher and Cleveland have conducted numerous investigations of the body-image boundaries with both pathological and normal individuals and have found consistent relationships between body-image boundaries, personality, and individual and group behavior. These findings will be discussed later.

Unlike the above described measuring techniques, which attempt to tap the unconscious body-image and to avoid self-reporting of the subject, various self-inventories have been established to investigate one's conscious knowledge and attitudes about the body. One such measurement instrument was devised by Secord and Jourard. (18) They defined a dimension of the body-image as the "body cathexis, the degree of feeling of satisfaction or dissatisfaction with the various parts or processes of the body." (18:394) They devised a "Body-Cathexis

Scale" consisting of a listing of forty-six parts and functions of the body. The subject is instructed to indicate the "strength and direction of feeling which he has about each of the various parts or functions" by encircling one of five numbers after each part or function according to the following scale:

1. Have strong feelings and wish change could somehow be made.
2. Don't like, but can put up with.
3. Have no particular feelings one way or the other.
4. Am satisfied.
5. Consider myself fortunate. (18:395)

Secord (18) also devised a "Homonym Test of Body-Cathexis" to tap anxiety consisting of a list of seventy-five homonyms each of which has meanings pertaining to the body and meanings not related to the body. The subject is instructed to respond to the words, presented orally at a rate of one every five seconds, by writing down the first word that occurs to him. The score is obtained by totaling responses to bodily meanings. (18:397)

Zion (83) developed a "Body Concept Scale" to investigate four facets of the body concept: "body description", "body acceptance", "ideal body", and "body description-ideal discrepancy." The test consists of sixty traits concerning attitudes in the following areas:

Attitudes affected by opposite sex.
Attitudes regarding Movement.
Attitudes regarding Grooming.
Attitudes regarding Expressiveness, including physical qualities indicative of the use of the body to convey feeling.
Attitudes regarding masculinity-femininity, including physical qualities depicting womenliness and manliness. (83:493)

The traits are listed in a vertical column followed by three blank columns for the first three facets of the body concept, "body description", "body acceptance", and "ideal body." The test consists of five different Guttman Scales for each of the three columns. Guttman Scales provide descriptions for rating each listed trait in each column. The scale for the first column for body description, titled "I am a (an) _____ person", consists of "(1) not at all, (2) a little, (3) average, (4) moderately, (5) very much." (83:491) The scale for column two, "body acceptance", consists of "(1) very much dislike, (2) dislike, (3) neither like nor dislike, (4) like, (5) very much like." (83:491) The scale for column three, "ideal body", is the same as that for column one.

The subject is instructed to place a number, one through five, in each column according to the degree each trait characterizes him. The ratings for the fourth column, "body description-ideal discrepancy", are determined by finding the difference between the "body description" and "ideal body" ratings.

Doodlah (85) devised seventy-five "Body-Image Concept Statements" and utilized the Q-sort Technique to measure body-image concept. This technique involves the sorting of the statement cards according to a predetermined number into nine columns. The nine columns represent a continuum from "least like me" in column one to "most like me" in column nine. The subject sorts the cards first according to the degree to which each statement characterizes her own body "at the exact moment in time", the

Self-Sort, and secondly according to the degree to which each statement characterizes how she "would ideally like her body to be," the Ideal-Sort. The results of the sorting are recorded by writing the number of the column in which each statement was placed on a score sheet. The body-image concept score is then determined by summing the squares of the differences between the Self-Sort and Ideal-Sort and reading this sum on a nomograph to determine the correlation coefficient between the Self-Sort and Ideal-Sort.

Much research has been conducted that strongly supports a relationship between body-image and personality. Secord and Jourard (18:394) wrote, ". . . the individual's attitudes toward his body are of crucial importance to any comprehensive theory of personality." Fisher and Cleveland (15) pointed to the implications of body-image in the personality theories of Freud, Adler, and Jung, stating that "Freud conceived of the Body-Image as the original framework for the development of the whole ego structure" (15:46); that much of Adler's theory that neurosis and personality maladjustment were based on "elaborate strategems designed to compensate for organ inferiority" (15:46); and that Jung believed that

> different areas of the body have a shifting hierarchial pattern of importance to the individual and that his existing hierarchy has definite effects upon behavior. (15:47)

Schilder (33:105) emphasized the relationship between personality and body-image, saying that the body-image is "built up according to the needs of the personality."

Investigators of the body-image boundaries have suggested that "the process of learning to separate one's body from its environs is fundamental in the establishment of identity. . . ." (52:62)

Fisher and Cleveland (15) have noted an essential relationship between the body-image boundary distortions and certain personality maladjustments. Working with neurotic and psychotic patients, they have noted disturbed body attitudes having to do with masculinity or femininity (15:15), feeling of body disintegration and deterioration, feelings of depersonalization involving a denial of the existence of body parts and a sense of loss of body boundaries. (15:16)

Fisher (53) conducted extensive research on "body attention patterns" and their relation to certain personality variables. He reported evidence which supports the hypothesis that certain personality defenses are related to the manner in which an individual distributes attention to the right or left of the body, to the front or back of the body, or to specific organs of the body. (53:29) Fisher stated:

> . . . one's body is uniquely close to the ego or self and therefore likely (as is true of many ego-significant targets) to become in whole or part a 'screen' upon which one projects attitudes about self and the world. (53:27)

Behavioral implications of the body-image are highly evident in the literature. Fisher and Cleveland (15:345) spoke of the body-image as one's "base of operations" that is "significant in

influencing how he conducts himself." They suggested that the body-image boundary measure is of great importance in predicting behavior. Research investigating the relationship between body-image boundaries and individual behavioral characteristics suggests a link between these two factors. Fisher and Cleveland (15:150) investigated behaviors described as "self-steering." They noted a significant relationship between high boundary definitness and high goal setting, high need for task completion, low suggestibility, ability to express anger outwardly when frustrated, ability to tolerate stress, and degree of orientation toward self-expressiveness. (15:118)

In addition to the investigation of "self-steering" behaviors, Fisher and Cleveland studied group behavior in relation to body-image boundaries. They concluded that the body-image boundary seems to play a role in one's style of interaction in group situations, having found the Barrier Score positively related to such variables as "spontaneous expressiveness, independence, promoting group goals, warmth and friendliness, and willingness to face up to hostility." (52:67)

Research with the body-image boundary concept has led to suggestions of a relationship between boundary definiteness and degree of participation in athletic activities. Fisher and Cleveland (15:91) found that high Barrier scorers sought muscular expression in athletic activities and seemed to take a more "active 'muscular' attitude toward life" than low Barrier scorers.

In addition to evidence of a relationship between the body-image and physical activity, research has strongly suggested

a connection between body-image and certain cognitive functioning. Armstrong (83:4) pointed out that the evidence seems to support the view that the body serves as a "necessary reference point for many non-body related judgements and skills." He stated:

> . . . a certain degree of 'Body-Image integrity' or accurate knowledge of our physical being is an essential underpinning for such apparently unrelated phenomena as arithmetical reasoning, reading, spontaneous writing, accuracy of perceptions of other persons and, indeed, all perceptions and cognitive activities of the human organism. (83:2)

Fisher (54:138) investigated whether one's awareness of his body may influence learning and recall and found that those who displayed a greater awareness of their own bodies in relation to the total perceptual field were superior to those demonstrating a low body awareness in recalling words related to the body. In a later summary of the literature in this area Fisher wrote:

> . . . the major import of the data is in lending support to a model in which the body image is conceptualized as a series of peripheral landmarks from which emanate sensations that can reinforce or inhibit central cognitive processes. (55:550)

After reviewing the literature and conducting numerous studies to ascertain whether there are sex differences in body concept and perception, Fisher (56) concluded that a number of sex differences in body-image do exist and that "these differences relate not only to obvious matters of anatomy but also to particular cultural definitions of masculinity and femininity." (56:20) He found that men were more receptive than women to the perception of alterations in the appearance of their legs induced

by aniseikonic lens and suggested that this finding was due to the American female's relatively high anxiety about her legs. (56:20) In addition, Fisher found data to suggest that women may have a "more clearly articulated and stable body-concept than men." (56:1) This contradicted the earlier assumptions regarding the superiority of male to female in body concept.

Another interesting area has been examined to determine the relation of body-image concept to body size. Research has clearly shown that an individual's body-image attitudes may affect the perception of his body size. Wapner and Werner wrote:

> Apparently, there is a basic tendency for body feelings to be translated into body size terms. The individual seems to register the many alterations in his body feelings as shifts up and down a scale of smallness-bigness. (38:51)

Jourard and Secord (65) investigated the relationship between body-cathexis ratings and size of body parts of females. Sixty female students were instructed to signify the nature of feelings toward selected body parts according to a seven point cathexis scale, to estimate the size of these body parts, and to complete an ideal body size questionnaire. The investigators then made direct measurements of these body parts. They found that significant correlation between measured size of selected body parts and cathexis for those parts existed; that ideal sizes for waist, and hips were smaller than measured and estimated sizes of these parts, whereas the ideal bust measurement was larger than measured bust size; and that cathexis ratings for five of the body parts varied with the extent of deviation

of measured and estimated size from the ideal size. They concluded that there seems to exist a shared ideal for certain dimensions of the female figure. (65:246)

Kurtz (100) investigated the relations of body attitude to body size, sex, and body build of college students. He measured male and female students, age eighteen through twenty-three years. Measuring Osgood's three attitudinal dimensions, that is, "Evaluation, Potency, and Activity", on thirty Body Concepts; Rees-Eysenck Index to classify body size into Small, Medium and Large and a classification of body build into Eurymorphs (wide squat build), Mesomorphs (medium build), and Leptomorphs (thin narrow build), Kurtz concluded that peoples' attitudes toward their bodies vary as a function of size, sex, and shape of their bodies.

Sugarman (78) investigated body type as it relates to body-cathexis. Using human figure drawings of various body types to ascertain body cathexis, his findings supported the idea of "cultural stereotypes associated with body type." (78:393)

A positive relationship between body-image concept and self-concept has been supported by empirical evidence in a number of studies. Secord and Jourard (18) administered their Body-Cathexis Scale, described earlier, a Self-Cathexis Scale, a Homonym test of anxiety-related body-cathexis, and the Maslow Test of Psychological Security-Insecurity to a group of college men and women. They found a significant positive correlation between body-cathexis and self-cathexis, as well as a relationship between low body-cathexis and psychological insecurity. (18:402)

Weinberg (81) replicated the above findings in a similar study, noting these two relationships between body-cathexis: self-cathexis and body-cathexis:psychological insecurity tended to be of greater magnitude for men than for women in his study.

Zion (83), using her Body-Concept Scale, described earlier in this review, and Bills Index of Adjustment and Values to measure self-concept, found a

> significant linear relationship between self description and body description, ideal self and ideal body, and self description-ideal discrepancy and body description-ideal discrepancy. (83:490)

Research in physical education concerning the body-image concept has mainly investigated the relation of body-image concept, self-concept, and/or movement concept as they relate to motor ability and performance. Doodlah (85) utilized the Q-sort methodology to investigate the relation of low and average motor ability to self-concept, body-image concept, and movement concept as expressed by sorting seventy-five Self-Concept Statements, seventy-five Body-Image Concept Statements, and seventy-five Movement Concept Statements. Her findings indicated a relationship between self-concept:body-image concept and body-image concept:movement concept. She did not find a significant relationship between movement concept:self-concept. In terms of low and average motor ability, she found no difference between the two groups with respect to body-image concept or self-concept, but did note a difference with respect to movement concept. Doodlah's conclusions with regard to movement concept will be discussed in the next section.

McFee (102) investigated the relationship between body-image boundaries, estimates of one's body dimensions and performance of six motor tasks of late adolescents. Using both male and female subjects, she measured body-image boundaries by obtaining Barrier Scores from the Holtsman Inkblot test. Using a grid method devised by McFee and a modification of the Popper Height Estimation Test, the students estimated their body space dimensions in terms of standing and extended heights, span, and shoulder and hip widths. The six motor tasks performed were catching and throwing, standing broad jump, shuttle run, obstacle race, basketball throw for distance, and the target jump. McFee found that these subjects with low Barrier Scores tended to over-estimate their vertical dimensions and to perform poorly on the motor skills. She found sex differences in terms of male superiority in motor task performance, accuracy of body dimension estimations, and Barrier Scores. McFee also noted that students more accurately estimated horizontal body dimensions than they did their vertical dimensions, and she suggested that the over-estimation of the vertical dimensions may have resulted from "unconscious operations", while the accurate horizontal dimension estimations may have been due to "conscious behavior." McFee further postulated the following:

> When the body image is well articulated, the subject may be able to include more of his environment within his concept of body-image, and may be able to better manipulate his body and other objects in the space in which his body maneuvers. (102:1440)

Combining her data with that of Woods (104), who had previously conducted a similar study with eight, ten and twelve year olds, McFee suggested certain maturational trends of increased Barrier Scores and increased accuracy of body dimensions estimation with age.

Fulton (96) investigated the effects of twelve weeks of physical education instruction, designed to improve physical abilities in selected motor skills, on the body-image and self-concept of college males. Although he found significant correlations between body-image and self-concept and a significant improvement in motor performance on the measured skills, he noted no significant correlation between improved performance of the measured skills and change in either body-image or self-concept.

Elbaum (95) evaluated thirty six and seven year olds in terms of motor development, as measured by the Lincoln-Lseretsky Motor Development Scale, and body-image, as measured by Draw-a-Person Test. She found a high correlation between motor development and body-image.

Nelson (90), using Secord and Jourard's Body-Cathexis-Self-Cathexis Scales, a Movement Concept Scale devised from Doodlah's Movement Concept Q-sort statements, Shostrom's Personal Orientation Inventory to measure self-actualization, Wyrick's Motor Creativity Test to measure an individual's ability to produce fluent motor responses to specified situations, and Secord's Homonym Test to measure body concern,

investigated the relationships among body-cathexis, self-cathexis, movement concept, motor creativity and four aspects of self-actualization; self regard, self acceptance, spontaneity, and inner directedness. In general, her findings indicated that body-cathexis was related highly to self-concept, movement concept and the above self-actualization variables. Her findings concerning movement concept will be discussed in the following section.

MOVEMENT CONCEPT

Movement concept is a relatively new term in the literature, and research on movement concept has mainly been conducted in the area of physical education. Movement concept has been defined as "that view an individual has of himself as a physically mobile entity." (85:16) With a few exceptions movement concept has been measured by self-inventories which tap the difference between one's real moving self and ideal moving self. Research in this area has mainly been directed to investigate the relation of movement concept to body-image and self-concept, and certain motor performance and abilities.

Doodlah's study (85), as described above, has served as a guide to many of the later investigations on movement concept. Her seventy-five Movement Concept Statements, designed for a Q-sort, have been used widely. As has been noted in the previous section, her data indicated a significant relationship between body-image and movement concept but no significant relationship

between movement concept and self-concept. She concluded that this latter finding may indicate that "there is little, if any, relationship in the subject's conceptualization between the self and movement." (85:41-42)

As mentioned in the previous section, Doodlah noted no significant difference between low and average motor ability groups with respect to body-image concept or self-concept, but she did find a significant difference between these two groups with respect to movement concept, noting a lower real-self ideal-self discrepancy in the average motor ability group. Doodlah concluded that this finding may indicate the following:

1. Movement has more meaning to the Average Motor Ability Group.
2. Perceiving oneself as a moving being is more characteristic of the Average Motor Ability Group than the Low Motor Ability Group. (85:42)

Doodlah further concluded that the "views held by the Low Motor Ability Group regarding Movement may be influencing their motor performance." (85:43)

Smith and Clifton (77) examined the effect of viewing oneself performing selected motor skills in motion pictures upon the concept of one's own movement. Sixty male and female college students, age seventeen through twenty-one years, were divided into three groups: Group Viewers, Individual Loop Viewers, and Controls. The students performed five skills: walking, running, catching, throwing, and broad jumping. The subjects' skill performances were filmed. Following the skill performances, the subjects responded to a Perception Checklist

in which they were to select words or phrases descriptive of their performance and to indicate whether each word or phrase was favorable or unfavorable. After a four week interim, the Individual Loop Viewers viewed their own skill performance and then again completed a Perception Checklist. The Group Viewers viewed film of the entire group performing the above skills and then completed the Perception Checklist. The Controls were divided into two groups, the first group again performing the five skills with only the instructor present and the second group performing the five skills in front of the entire class and the instructor. Both Control groups then completed the second Perception Checklist.

Clifton and Smith found that significantly more positive scores were obtained from the experimental group subjects after viewing films of their performance. They also noted that "group viewers tended to score themselves significantly less positively than did loop viewers in catching. They suggested that:

> . . . one's scores representing his expressed concept of self performing five basic motor skills changes after viewing motion pictures of his performance of these skills. (77:374)

Another study of Smith and Clifton (76) was directed to compare the expressed self-concept of males and females concerning their motor performance. Utilizing the Perceptual Checklist to rate themselves on performance of running, catching, throwing and broad jumping, the college subjects were then evaluated on their actual performance of these skills. The findings indicated

that the males rated themselves more favorably than the females and that "the greatest disparities between the groups were observed in the rating of performance of those skills which required more energy output and strength." (76:73)

Clifton and Smith (48) then conducted a second study to examine sex differences with respect to expressed concept of movement, but in this study they limited their subjects to highly skilled males and females. The same procedures were used as in the above study. The investigators found evidence to support the findings of the previous study and concluded that

> males and females differ in their expressed self-concepts of their own motor performances, although fewer differences are apparent in a comparison of highly skilled females with highly skilled males. (48:201)

Whether the differences in expressed self-concepts of movement between the sexes are due to actual differences in skill or are a function of cultually induced feelings about motor competencies of the male and female remains to be investigated.

Using Smith and Clifton's Perception Checklist to obtain self-rating scores in ball throwing and broad jumping and the Hunt-Weber Body-Image Projective Test to tap "Body-Image Security", McBee (101) found that a secure body-image correlated highly with secure feelings about one's movement in these two skills.

Killiam (87) examined the relation between movement concept and body-image of college freshmen of low, average, and

high motor ability and posture. Using Doodlah's Body-Image Concept Statements and Movement Concept Statements, she found a significant relationship between movement concept and body-image in the low group, but not in the average or high motor ability groups. Her findings indicated a significant difference between the low and high motor ability groups in terms of movement concept, suggesting that perhaps extreme low or high motor ability may be a factor in one's movement concept.

As described previously, Nelson (90), examining the relationships between four aspects of self-actualization, body-cathexis, self-cathexis, movement concept, and motor creativity, found that movement concept was related to self-regard, spontaneity, inner-directedness, self-cathexis and body-cathexis. Nelson concluded:

> The relationships between the self-actualization variables and body-cathexis plus the relationship of confidence in one's movement to self-regard, spontaneity, and inner-directedness, could imply a responsibility on the part of educators to provide experiences which will help children develop confidence in their ability to move and satisfaction with their bodies. (90:68)

Nation (89) investigated the relative effects of five weeks of instruction in three different activities: body mechanics, beginning swimming, and fencing on movement concept of college women. Using Doodlah's Movement Concept Statements, she found that all of the classes were equated in terms of movement concept after the five weeks of instruction. Nation further noted a significant change of movement concept in the

swimming and fencing classes but not in the body mechanics class. She suggested that the lack of change in the body mechanics group may have been caused by "the subjects having felt their movement concept adequate prior to initial instruction" or by "the subjects changing their ideal concept of movement." (89:37) Nation explained that the significant changes in swimming and fencing classes may have been due to the fact that the subjects were "continually allowed freedom to initiate movement, to progress in skill levels, to measure success and to experience accomplishment in performance." (89:38) This certainly points to the importance and possible effects of the classroom environment on the student's feelings about himself.

Research investigating the effects of teaching methodology on the movement concept is very limited. Richardson's study (93) of the effect of different approaches to teaching gymnastics on the movement concept closely approximates the present study. Investigating the Movement Education versus the Traditional-Teacher Directed approaches, Richardson utilized Doodlah's Movement Concept Statements. In order to minimize any bias that might be present, different teachers conducted the two different classes after establishing common objectives for the classes. Administering the Movement Concept Q-sort prior to and after the instructional period, Richardson found no significant difference between the two classes in movement concept at either administration. Comparing the movement concept scores obtained before and after instruction in each class, she found a significant

difference between initial and final scores in the Movement Education class but not in the Traditional-Teacher Directed class. She also noted a significant difference between the self and ideal-self within the Movement Education class but not within the Traditional-Teacher Directed class. Richardson made the following conclusions:

> The Movement Education Approach to gymnastics results in a narrowing of the discrepancy between the self- and ideal-self.
>
> Both the Movement Education Approach and the Traditional Approach to gymnastics results in the subjects re-evaluation of the ideal-movement concept and the reassessment of the real-self in relation to the changed ideal.
>
> The Movement Education Approach appears to affect the real-self component of Movement Concept more than the ideal-self component. This suggests that such an approach enhances a student's feelings of adequacy and satisfaction when measured in terms of her ideal.
>
> A concomitant of the Movement Education Approach seems to be the reported satisfaction which students derive from the creative process of problem solving. The total involvement of the student seems to induce confidence in her ability to succeed in a movement task. (93:73-74)

The implications of Richardson's study to the present study are evident. Because problem solving was utilized in her Movement Education class one might expect to note similar findings in the present study with regard to movement concept.

CHAPTER IV

PROCEDURES

PURPOSE

The purpose of this study was to investigate the effects of two methods of teaching gymnastics free-exercise routines on the Body-Image Concept and Movement Concept of beginning gymnasts. The first method consisted of teaching optional routines by the problem-solving approach. The second method consisted of teaching a compulsory routine by the demonstration-explanation approach.

SELECTION OF SUBJECTS

The subjects for this study were the twenty-four freshmen, four sophomore, and two senior women students, age range 18 through 21, enrolled in a beginning gymnastics class during Spring semester, 1970, at The University of North Carolina at Greensboro. The subjects were divided into two groups: Group I taught by the problem-solving method and Group II taught by the demonstration-explanation method.

DURATION AND SCHEDULE

The duration of the study was twelve weeks. The first three weeks consisted of introduction to the study, organization procedures, skills testing, and initial Movement Concept and Body-Image Concept testing. The next seven weeks consisted of

the instructional phase in which Group I was taught by the problem-solving approach and Group II was taught by the demonstration-explanation approach. The last two weeks consisted of the final Movement Concept and Body-Image Concept testing and an evaluation of the free-exercise routines.

Introduction, Grouping and Initial Skills Test

During the first class meeting the usual administrative procedures were handled, checking class role and giving locker assignments. This was followed by a general explanation of the purpose and importance of the study accompanied by a brief resumé of the experimental schedule for the semester. Time was then allowed for a question-answer period. The students were informed that the data collected in the study would remain confidential and that the Movement Concept and Body-Image Concept scores would in no way affect their grades in the course.

During the second class period possible scheduling into Group I or Group II was discussed. Because Group I was to meet from 8:55 to 9:30, fifteen minutes early, the students who had an 8:00 class with no 10:00 commitment were assigned to Group II. Likewise, because Group II was to meet from 9:30 to 10:05, those students who had a 10:00 commitment with no 8:00 class were assigned to Group I.

Within the above limitations of students' schedules the investigator attempted to equate Group I and Group II in terms of skill level, assigning students according to their skill

ratings obtained in an initial gymnastics skills test which included the execution of a forward roll, backward roll, headstand, hitchkick and cartwheel. The method of skill evaluation will be described below. Thus, grouping was based on two factors, students' schedules and students' beginning skill ratings.

Following a discussion of the grouping, the purpose and procedures of the skills test were explained, the students being informed that the skills testing was not to be used for grading, but only for grouping purposes.

During the third and fourth class periods the skills test was administered by the investigator. The following four-point rating scale was developed to evaluate each of the five skills:

Excellent - 4
Good - 3
Fair - 2
Poor - 1
No attempt - 0

The criteria for each rating (4, 3, 2, 1, 0) were described for each skill on the rating sheet. A copy of the rating sheet appears in the Appendix.

Selection and Administration of Body-Image Concept and Movement Concept Tests

Seventy-five Body-Image Concept statements and seventy-five Movement Concept statements devised by Doudlah (85) were administered by utilizing the Q-sort Technique, as described by

Stephenson. (37) A copy of Doudlah's statements appear in the Appendix. The Q-sort was appropriate for this study because it clearly measures the correlation between the self and the ideal-self and it permits the interpretation of the test items to be left to the subject.

Q-sort methodology involves the sorting of a set of statements typed on cards according to the degree to which each statement characterizes the subject's concept of herself and ideal-self. The subject is instructed to sort the cards into nine piles, each pile containing a predetermined number of statements. This imposed arrangement of statements will result in a distribution based on the normal curve.

The nine piles represented a nine-point scale, with the left-hand side labeled "least like" and the right-hand side labeled "most like". According to the imposed distribution of the statement cards, based on the normal curve, the subject was required to place the two statements which she felt were "least like" her in column one and the two statements she felt were "most like" her in column nine. The subject then placed the remaining seventy-one statements in predetermined numbers in columns two through eight according to the degree to which they described her self and ideal-self concepts.

The sorting distribution was as follows:

LEAST LIKE								MOST LIKE
1	2	3	4	5	6	7	8	9
(2)	(5)	(9)	(13)	(17)	(13)	(9)	(5)	(2)

(Number of statements in Parentheses)

Since it was the purpose of this study to investigate how the subject actually perceived herself and how she would ideally like to be in terms of two areas, Movement Concept and Body-Image Concept, it was necessary for the subject to complete four separate sorts prior to and after the gymnastics routine instruction, a self-sort and ideal-sort for Movement Concept and a self-sort and ideal-sort for Body-Image Concept. All testing was supervised by the investigator. The students met twice for testing, the first meeting for the Movement Concept sort and the second meeting for the Body-Image Concept sort. The same procedures were followed at both testing sessions. During each testing session the following materials were provided:

1. Instruction sheet for the Q-sort.
2. Set of Movement Concept statements (at first meeting).
   Set of Body-Image Concept statements (at second meeting).
3. Strip of cardboard with columns one through nine and the predetermined number of statements to be sorted under each column from "Least Like" to "Most Like".
4. A white Self-Sort answer sheet.
5. A yellow Ideal-Sort answer sheet.
6. A pencil.

On the first meeting for testing, the seventy-five Movement Concept statements were presented with instructions to complete the self-sort by placing the cards from the point of view of how the subject saw herself as a moving person at that exact moment in time. After completion of the self-sort, the

subject was then asked to complete the ideal-sort from the point of viewof how she would ideally like to be as a moving person. In the second testing session, two days afterward, the subject was instructed to follow the same procedure to complete a self-sort and ideal-sort in terms of Body-Image, sorting the Body-Image Concept statements according to how she viewed her own body at that exact moment in time for the self-sort and according to how she would ideally like her body to be for the ideal-sort.

The seventy-five Movement Concept and Body-Image Concept statements were typed and mimeographed on biology filler paper and cut to the size of one and one-half inches by two and one-half inches. Each card was numbered in black to match the corresponding number on the white answer sheet and yellow answer sheet.

Cardboard strips were cut to a size of two inches by twenty-eight inches. Column headings, one through nine, were printed in black; the number of statements to be placed within each column being printed in red in parentheses below each numeral. During the Q-sorting, subjects placed the proper number of statement cards under the desired column appearing on the strip of cardboard.

During each testing period the white answer sheet was used to record self-sort and the yellow answer sheet was used to record the ideal-sort. Each answer sheet was numbered one through seventy-five, corresponding to the black numbers on each statement card. Immediately following each sort, the

student was instructed to record the results of her sort on the appropriate answer sheet by writing the number of the column in which each statement card had been placed after each statement number on the answer sheet. Each student had been given a permanent experiment number and was required to place this number on both white and yellow sheets in the space provided.

Scoring of the Q-sort

A nomograph, as described by Cohen (49), may be used in Q-sort methodology to determine the correlation coefficients between self-sort and ideal-sort. Based on Cohen's nomograph Doudlah (85) constructed a nomograph for a nine-point scale of seventy-five statements. Her nomograph was appropriate for this study and was, therefore, utilized by this writer. A copy of the nomograph appears in the Appendix.

To facilitate the computation of the Movement Concept and the Body-Image Concept scores for each individual, a tabulation table was constructed consisting of eight columns across the top and seventy-five rows numbered down the side of the paper. The columns were divided into two main categories, Movement Concept on the left and Body-Image Concept on the right. Each of these two main categories was then subdivided into four columns titled "S", "I", "D", and "D^2" representing self-sort, ideal-sort, difference between the self-sort and ideal-sort, and the difference squared, respectively. The "D^2" column was then summed for both the Movement Concept and Body-Image Concept sorts. A copy of this sheet appears in the Appendix.

The correlation coefficients were then read by entering the nomograph either from the left or the right, depending on the value of D^2. For any sum of D^2 from 0 to K the nomograph was entered from the left at the level of the D^2 value, and the correlation coefficient was then read from the bottom (positive) scale by proceeding to the diagonal line and dropping down to the bottom scale. For any sum of D^2 from K to 2K the nomograph was entered from the right and the correlation coefficient was then read from the top (negative) scale.

Second and third tabulation tables, similar to the previously described table, were devised to record the discrepancy between the initial self-sort and the final self-sort and between the initial ideal-sort and the final ideal-sort. These tables differed only in the column headings. Table II (initial to final self-sort) columns were headed "S_i", "S_f", "D", and "D^2". Table III (initial to final ideal-sort) columns were labeled "I_i", "I_f", "D", "D^2", again under the two main categories of Movement Concept and Body-Image Concept. Correlation coefficients were computed for these two tables by use of the nomograph. A copy of all correlation coefficients appears in the Appendix.

Instruction

Both Group I and Group II were taught by the writer to minimize the variable of teacher personality possibly affecting the results of the study. The two groups, differing only in the method of instruction (problem-solving versus demonstration-explanation), had the same main objective, which was to develop

the ability to perform a free-exercise routine in a manner consistent with principles of good composition and aesthetic movement.

It was a basic premise that at the completion of seven weeks of instruction, the two groups would achieve similar proficiencies, in terms of routine performance, regardless of the teaching approach. To evaluate the final competencies in performing the routines the writer judged each routine on a ten-point basis. Judging was not based on an Olympic standard, but rather, on a beginning standard established by the writer. A copy of the judging form appears in the Appendix.

The general structure of the problem-solving approach consisted of presenting the problem, observing the movement responses of the students, and posing sub-problems. In so doing, the investigator attempted to provide for all students the opportunity to reach an acceptable solution. Though any solution that met the criteria of the problem was acceptable, each student was constantly encouraged to strive for quality and excellence of form. All students in Group I worked individually to find their own solutions to the problems, with ample time to explore possible solutions. Discussions of movement solutions and movement principles occurred after each lesson when appropriate.

Progression in the development of a routine was accomplished by structuring problems related to the following three steps in routine development:

1. Development of separate movement skills.
2. Combination of movements to build movement sequences.
3. Combination of movement sequences to form a complete routine.

Generally, two types of problems were presented: specific movement problems and composition problems. The specific movement problems were designed to examine the elements of movement and their dimensions as shown below:

ELEMENTS

DIMENSIONS	Time	Force	Space	Flow
	fast-slow	strong-weak	directions	free
	acceleration-deceleration	heavy-light	levels	bound
		tense-relaxed	ranges	
	rhythm			
		hard-soft	pathways	

The composition problems were designed to examine the combination of movements into movement sequences and of movement sequences into a complete routine. These composition problems were focused around the following principles of composition.

1. Transition
2. Continuity
3. Contrast
4. Variety
5. Planned Repetition
6. Originality

The writer recognized that to solve these composition problems the student must first have a knowledge and awareness of the way

her body is able to move in terms of the above movement elements and their dimensions. A copy of the Group I lesson plans appears in the Appendix.

All students in Group II were taught the same compulsory routine by the demonstration-explanation approach. Progression in learning the routine was accomplished by first teaching the separate skills involved in the routine, then by combining these skills into separate sequences, and finally by combining the movement sequences into the entire routine. The writer demonstrated and explained each skill or movement sequence while the group observed the performance technique and spotting technique and asked questions. Then all students tried the movement in mass, followed by separate practice with the teacher moving throughout the class giving individual assistance. Discussion of principles of movement and principles of composition were included at appropriate times.

A copy of the lesson plans for Group II appears in the Appendix.

CHAPTER V

ANALYSIS AND INTERPRETATION OF DATA

It was the purpose of this study to investigate the effects of two methods of teaching gymnastics free-exercise routines on the Body-Image Concept and Movement Concept of beginning gymnasts. Method I consisted of teaching optional routines by the problem-solving approach. Method II consisted of teaching a compulsory routine by the demonstration-explanation approach.

The subjects for this study were thirty college women enrolled in a beginning gymnastics class offered by the Department of Health, Physical Education, and Recreation of The University of North Carolina at Greensboro, in the second semester of 1969-70.

ANALYSIS OF DATA

The thirty subjects completed Q-sorts for Body-Image Concept and Movement Concept prior to and following seven weeks of instruction. Correlation coefficients for the following were completed by the use of a devised nomograph:

a. Between the self-sort and ideal-sort of the Body-Image Concept prior to (initial) and after (final) instruction.

b. Between the self-sort and ideal-sort of the Movement Concept prior to and after instruction.

c. Between the self-sort of Body-Image Concept prior to instruction and the self-sort of Body-Image Concept after instruction.

d. Between the ideal-sort of Body-Image Concept prior to instruction and the ideal-sort of Body-Image Concept after instruction.

e. Between the self-sort of Movement Concept prior to instruction and the self-sort of Movement Concept after instruction.

f. Between the ideal-sort of Movement Concept prior to instruction and the ideal-sort of Movement Concept after instruction.

The correlation coefficients between the self-sort and the ideal-sort in the Movement Concept and Body-Image Concept Tests, a and b above, have been considered as Movement Concept and Body-Image Concept scores throughout the statistical manipulation of the data.

Data were organized into groups: Group I using the problem-solving method and Group II using the demonstration-explanation method. These data are presented in Tables XIV, XV, XVI, XVII, XVIII, and XIX in the Appendix.

Because the subjects for this investigation were chosen from a scheduled physical education class in the required program at The University of North Carolina at Greensboro, the investigator

was unable to equate the two groups. Since the groups were unequated, the technique of analysis of covariance was used for the statistical analysis, thus providing for an adjustment of the groups as related to initial and final scores.

Null hypotheses were formulated regarding differences within and between groups on the variables mentioned. It was decided that a significance of difference at the 5 per cent level of confidence was an acceptable standard at which to find the hypotheses untenable.

The following null hypotheses concerning the Body-Image Concept were tested.

1. There is no significant difference between the Body-Image Concept scores of Group I and those of Group II prior to seven weeks of instruction.
2. There is no significant difference between the Body-Image Concept scores of Group I and those of Group II after seven weeks of instruction.
3. There is no significant difference between the Body-Image Concept scores prior to and after seven weeks of instruction in Group I.
4. There is no significant difference between the Body-Image Concept scores prior to and after seven weeks of instruction in Group II.
5. There is no significant difference between the Body-Image Concept scores prior to and after seven weeks of instruction for all subjects.

The sum of the squares and the cross products for the two groups of subjects on the initial and final performances appear in Table I. The analysis of covariance table for the Body-Image Concept scores, Table II, reveals that the F ratio obtained was not significant at the 5 per cent level of confidence. Therefore, all five of the above null hypotheses were found tenable.

The following null hypotheses concerning the Movement Concept were tested:

1. There is no significant difference between the Movement Concept scores of Group I and those of Group II prior to seven weeks of instruction.
2. There is no significant difference between the Movement Concept scores of Group I and those of Group II after seven weeks of instruction.
3. There is no significant difference between the Movement Concept scores prior to and after seven weeks of instruction in Group I.
4. There is no significant difference between the Movement Concept scores prior to and after seven weeks of instruction in Group II.
5. There is no significant difference between the Movement Concept scores prior to and after seven weeks of instruction for all subjects.

The sum of the squares and the cross products for the two groups of subjects on the initial and final performance appear

TABLE I

SUMS OF SQUARES AND CROSS PRODUCTS FOR TWO GROUPS OF SUBJECTS ON INITIAL BODY-IMAGE CONCEPT x AND FINAL BODY-IMAGE CONCEPT y

Source of variation	df	x^2	xy	y^2
Between groups	1	.006	0	0
Within groups	27	1.525	1.414	1.847
Totals	28	1.531	1.414	1.847

TABLE II

ANALYSIS OF COVARIANCE OF INITIAL AND FINAL BODY-IMAGE CONCEPT SCORES FOR TWO GROUPS OF SUBJECTS

Source of variation	Sum of squares of errors of estimate	df	Mean square	F
Total	.541	28		
Within groups	.536	27	.020	
				.250
Adjusted means	.005	1	.005	

in Table III. The analysis of covariance table for the Movement Concept scores, Table IV, reveals that the F ratio obtained was not significant at the 5 per cent level of confidence. Therefore, all five of the above null hypotheses were also found tenable.

The following null hypotheses concerning the change in self-sorts and change in ideal-sorts of the Body-Image Concept were tested:

1. There is no significant difference between the initial and final self-sorts of the Body-Image Concept in Group I.
2. There is no significant difference between the initial and final self-sorts of the Body-Image Concept in Group II.
3. There is no significant difference between the initial and final ideal-sorts of the Body-Image Concept in Group I.
4. There is no significant difference between the initial and final ideal-sorts of the Body-Image Concept in Group II.

Fisher's "t" test of significance of difference between correlated means was used to test the above hypotheses. The real-self and ideal-self correlation coefficients were examined in relation to a perfect correlation which would indicate no change between initial and final tests.

TABLE III

SUMS OF SQUARES AND CROSS PRODUCTS FOR TWO GROUPS OF SUBJECTS ON INITIAL MOVEMENT CONCEPT x AND FINAL MOVEMENT CONCEPT y

Source of variation	df	x^2	xy	y^2
Between groups	1	0	0	0
Within groups	27	1.633	.658	1.042
Totals	28	1.633	.658	1.042

TABLE IV

ANALYSIS OF COVARIANCE OF INITIAL AND FINAL MOVEMENT CONCEPT SCORES FOR TWO GROUPS OF SUBJECTS

Source of variation	Sum of squares of errors of estimate	df	Mean square	F
Total	.777	28		
Within groups	.777	27	.029	
				0
Adjusted means	0	1	0	

Statistically significant scores were found for all four of the above hypotheses. Thus, the above hypotheses were found untenable at the 5 per cent level of confidence. Results of these data are presented in Tables V and VI.

The following null hypotheses concerning the change in self-sorts and change in ideal-sorts on the Movement Concept were tested:

1. There is no significant difference between the initial and final self-sorts of the Movement Concept in Group I.
2. There is no significant difference between the initial and final self-sorts of the Movement Concept in Group II.
3. There is no significant difference between the initial and final ideal-sorts of the Movement Concept in Group I.
4. There is no significant difference between the initial and final ideal-sorts of the Movement Concept in Group II.

Fisher's "t" test of significance of difference between correlated means was again used to test the above hypotheses. Statistically significant scores were found for all four of the above hypotheses. Thus, the above hypotheses were found untenable at the 5 per cent level of confidence. Results of these data are presented in Tables VII and VIII.

TABLE V

SIGNIFICANCE OF DIFFERENCE OF MEAN CHANGE IN BODY-IMAGE CONCEPT SELF-SORT SCORES AFTER FINAL TESTING WHEN COMPARED TO NO CHANGE WITHIN THE PROBLEM-SOLVING CLASS AND THE DEMONSTRATION-EXPLANATION CLASS

Class	N	$\overline{D}$	"t"	Level of confidence
Problem-solving	15	.6591	10.171	5%
Demonstration-explanation	15	.7247	14.379	5%

TABLE VI

SIGNIFICANCE OF DIFFERENCE OF MEAN CHANGE IN BODY-IMAGE CONCEPT IDEAL-SORT SCORES AFTER FINAL TESTING WHEN COMPARED TO NO CHANGE WITHIN THE PROBLEM-SOLVING CLASS AND THE DEMONSTRATION-EXPLANATION CLASS

Class	N	$\overline{D}$	"t"	Level of confidence
Problem-solving	15	.7532	12.109	5%
Demonstration-explanation	15	.7347	18.984	5%

TABLE VII

SIGNIFICANCE OF DIFFERENCE OF MEAN CHANGE IN MOVEMENT CONCEPT SELF-SORT SCORES AFTER FINAL TESTING WHEN COMPARED TO NO CHANGE WITHIN THE PROBLEM-SOLVING CLASS AND THE DEMONSTRATION-EXPLANATION CLASS

Class	N	$\bar{D}$	"t"	Level of confidence
Problem-solving	15	.7121	11.197	5%
Demonstration-explanation	15	.6265	5.706	5%

TABLE VIII

SIGNIFICANCE OF DIFFERENCE OF MEAN CHANGE IN MOVEMENT CONCEPT IDEAL-SORT SCORES AFTER FINAL TESTING WHEN COMPARED TO NO CHANGE WITHIN THE PROBLEM-SOLVING CLASS AND THE DEMONSTRATION-EXPLANATION CLASS

Class	N	$\bar{D}$	"t"	Level of confidence
Problem-solving	15	.6975	6.656	5%
Demonstration-explanation	15	.5375	4.057	5%

Analysis of covariance statistical technique was utilized to examine the following hypotheses:

1. There is no significant difference with regard to change in self-sort of Body-Image Concept between Group I and Group II.
2. There is no significant difference with regard to change in ideal-sort of the Body-Image Concept between Group I and Group II.
3. There is no significant difference between change in self-sort and change in ideal-sort from initial to final Body-Image Concept within Group I.
4. There is no significant difference between change in self-sort and change in ideal-sort from initial to final Body-Image Concept within Group II.

The sum of the squares and the cross products for the two groups of subjects on the self-sorts and ideal-sorts appear in Table IX. The analysis of covariance table for the self-sort and ideal-sort scores, Table X, reveals that the F ratio obtained was not significant at the 5 per cent level of confidence. Therefore all four of the above null hypotheses were found tenable.

The following hypotheses regarding Movement Concept were also tested by analysis of covariance:

1. There is no significant difference with regard to change in self-sort of Movement Concept between Group I and Group II.

TABLE IX

SUMS OF SQUARES AND CROSS PRODUCTS FOR TWO GROUPS OF SUBJECTS ON THE BODY-IMAGE CONCEPT SELF-SORT x AND THE BODY-IMAGE CONCEPT IDEAL-SORT y

Source of variation	df	x^2	xy	y^2
Between groups	1	.032	.009	.002
Within groups	27	1.320	.814	1.052
Totals	28	1.352	.823	1.054

TABLE X

ANALYSIS OF COVARIANCE OF CHANGE IN SELF-SORT AND IDEAL-SORT FROM INITIAL TO FINAL BODY-IMAGE CONCEPT TEST FOR TWO GROUPS OF SUBJECTS

Source of variation	Sum of squares of errors of estimate	df	Mean square	F
Total	.553	28		
Within groups	.550	27	.020	
				.150
Adjusted means	.003	1	.003	

2. There is no significant difference with regard to change in ideal-sort of the Movement Concept between Group I and Group II.
3. There is no significant difference between change in self-sort and change in ideal-sort from initial to final Movement Concept within Group I.
4. There is no significant difference between change in self-sort and change in ideal-sort from initial to final Movement Concept within Group II.

The sum of the squares and the cross products for the two groups of subjects on the self-sorts and ideal-sorts appear in Table XI. The analysis of covariance table for the self-sort and ideal-sort scores, Table XII, reveals that the F ratio obtained was not significant at the 5 per cent level of confidence. Therefore, all four of the above null hypotheses were found tenable.

The following null hypothesis regarding final free-exercise routine performance was tested:

There is no significant difference between the problem-solving group and the demonstration-explanation group with regard to final competency in free-exercise routine performance.

Fisher's "t" test of significance of difference between uncorrelated means revealed no significant "t" at the 5 per cent level of confidence. Thus, the above hypothesis was found tenable. These data appear in Table XIII.

TABLE XI

SUMS OF SQUARES AND CROSS PRODUCTS FOR TWO GROUPS OF SUBJECTS ON THE MOVEMENT CONCEPT SELF-SORT x AND THE MOVEMENT CONCEPT IDEAL-SORT y

Source of variation	df	x^2	xy	y^2
Between groups	1	.005	.101	.192
Within groups	27	3.019	3.546	5.597
Totals	28	3.074	3.647	5.789

TABLE XII

ANALYSIS OF COVARIANCE OF CHANGE IN SELF-SORT AND IDEAL-SORT FROM INITIAL TO FINAL MOVEMENT CONCEPT TEST FOR TWO GROUPS OF SUBJECTS

Source of variation	Sum of squares of errors of estimate	df	Mean square	F
Total	1.462	28		
Within groups	1.432	27	.053	
				.566
Adjusted means	.030	1	.030	

TABLE XIII

SIGNIFICANCE OF DIFFERENCE BETWEEN MEANS OF FREE-EXERCISE ROUTINE SCORES FOR THE PROBLEM-SOLVING CLASS AND THE DEMONSTRATION-EXPLANATION CLASS AT THE COMPLETION OF THE COURSE

Class	N	M	"t"	Level of confidence
Problem-solving	15	6.17		
			.252	--
Demonstration-explanation	15	6.42		

INTERPRETATION OF DATA

Analysis of covariance revealed no significant difference between the initial and final Movement Concept scores nor between the initial and final Body-Image Concept scores in both the problem-solving group and the demonstration-explanation group. These results support the conclusions that seven weeks of gymnastics instruction did not change the subjects' concepts about their bodies or themselves as moving beings. These results may suggest that seven weeks of instruction, regardless of the teaching method utilized, is insufficient time to effect any change in Body-Image Concept or Movement Concept as measured by self-report instruments. On the other hand, the results may imply that the concepts the subjects had about their bodies and movement are not subject to change as a result of movement experiences in gymnastics free-exercise. Such an interpretation lends support to the idea of the suggested stability of an individual's concepts about herself.

Because Movement Concept and Body-Image Concept are a measure of the discrepancy between the real-self and the ideal-self, it is possible for the Movement Concept and the Body-Image Concept to remain unchanged while the real-self and ideal-self both change to the same degree. Therefore, the writer further examined the data to determine if any significant change occurred from the initial to final self-sorts and from the initial to final ideal-sorts of the Body-Image Concept and the

Movement Concept. The data indicated the following:

a. There was a significant difference between the initial and final self-sorts of the Body-Image Concept and the Movement Concept in both the problem-solving group and the demonstration-explanation group.

b. There was a significant difference between the initial and final ideal-sorts of the Body-Image Concept and the Movement Concept in both the problem-solving group and the demonstration-explanation group.

These results may indicate that, although seven weeks of gymnastics instruction did not result in a change in the self-ideal discrepancy with regard to Movement Concept and Body-Image Concept, both the problem-solving approach and the demonstration-explanation approach to gymnastics resulted in the subject's re-evaluation of the ideal Body-Image Concept and a corresponding reassessment of the real-self in relation to the changed ideal. From this interpretation it may be assumed that both approaches presented the students with situations which caused a considerable revision of how they viewed their ideal body and movement and of how they viewed themselves realistically in terms of the altered ideal.

When testing for differences in the amount of change in self-sorts of Body-Image Concept and Movement Concept between the problem-solving group and the demonstration-explanation group and for differences in the amount of change in ideal-sorts of

Body-Image Concept and Movement Concept between the problem-solving group and the demonstration-explanation group, analysis of covariance did not reveal significant F ratios.

These data may suggest that the problem-solving approach and the demonstration-explanation approach to gymnastics free-exercise results in similar re-evaluation of the real-self and ideal-self in terms of the Body-Image Concept and Movement Concept. This similarity may indicate that learning gymnastics free-exercise results in reassessment of the real-self and ideal-self in terms of Body-Image Concept and Movement Concept regardless of the teaching method utilized.

Testing for differences between the amount of change in real-self and the amount of change in ideal-self within each group with regard to one's body and movement, analysis of covariance, revealing no significant scores, suggested that both the problem-solving approach and the demonstration-explanation approach result in one reassessing the real-self to the same degree that one alters the ideal-self. These results offer support to the idea that an individual may seek to maintain the stability of her concept of her body and its capacity for movement within the total concept of self.

Evaluation of the free-exercise routine performance, based on a subjective judging form, revealed that the two groups were statistically equated at the completion of the study. These results tend to support the basic premise governing the research design that the two classes would achieve similar competencies

in terms of free-exercise routine performance regardless of the teaching method.

In conclusion, this study reveals comparable effects of a problem-solving approach and a demonstration-explanation approach on both the final competency in free-exercise performance and the attitudes about one's body and its movement capacities. Such conclusions suggest that attitudes about one's body and movement may be enhanced if students are sufficiently challenged and given the opportunity for successful experiences in the learning situation.

CRITIQUE AND SUGGESTIONS FOR FURTHER STUDY

Because the subjects did not represent a random sample and because the number of subjects available for experimentation in the gymnastics class situation was limited, the investigator emphasizes the fact that the data for this study are applicable only within the limitations of the research design.

A factor which may be a weakness of this study is the length of the instructional phase. The writer feels that perhaps a longer period of instruction than seven weeks may be required to significantly effect the subjects' concepts about their bodies and movement capacities through a movement experience if such ever really occurs.

A further limitation should be recognized when examining the effects of a gymnastics experience on the Movement Concept as measured by Doudlah's Test. This test includes seventy-five

statements concerned with the subjects' concepts of their movement in specific sports skills rather than broader concepts of movement. Many of these statements may not necessarily be related to the gymnastics free-exercise experience, and, consequently, any change in the subjects' concepts of their movement in free-exercise may not be revealed in Doudlah's Test. The writer feels that movement statements focused on broader movement concepts of time, force, space and flow might be more appropriate and applicable to the measurement of the subjects' concepts about movement in the gymnastics free-exercise experience and about all movement in general.

In view of the above limitations and the implications of the results obtained the following topics for further investigation are suggested:

1. A repeat of the present study utilizing a greater number of subjects, a longer instructional phase, and a reconstructed Q-sort comprised of statements concerned with broader concepts of movement.
2. A comparison of the effects of other methods of teaching gymnastics on Body-Image Concept and Movement Concept.
3. A study of the relationships among Body-Image Concept, Movement Concept and Self-Concept in a gymnastics class using problem-solving approach.
4. A comparison of the effects of problem-solving approach

on the Body-Image Concept and Movement Concept of subjects of different gymnastics skill levels.

5. A comparison of the effects of problem-solving in the four Olympic competitive gymnastics events on Body-Image Concept and Movement Concept.

CHAPTER VI

SUMMARY AND CONCLUSIONS

The purpose of this study was to investigate the effects of two methods of teaching gymnastics free-exercise routines on the Body-Image Concept and Movement Concept of beginning gymnasts. Method I consisted of teaching optional routines by the problem-solving approach. Method II consisted of teaching a compulsory routine by the demonstration-explanation approach.

The subjects for this study were thirty college women enrolled in a beginning gymnastics class offered at The University of North Carolina at Greensboro. The subjects were divided into the problem-solving and demonstration-explanation classes.

The Q-sort technique was selected as the tool most pertinent to a study of physical education on the Body-Image Concept and the Movement Concept because it clearly measures the correlation between the self and the ideal self, and it permits the interpretation of the test items to be left to the subject.

Two sets of statements, seventy-five Body-Image Concept statements and seventy-five Movement Concept statements, as devised by Doudlah (85), were used. The initial Q-sortings of the Body-Image Concept statements and the Movement Concept statements were completed by the subjects prior to the first class,

and the final Q-sortings were completed after seven weeks of instruction. Individual correlation coefficients between the real-self and the ideal-self of Body-Image Concept and Movement Concept for both the first and second testing were calculated by means of a devised nomograph. Correlation coefficients between initial and final self-sorts and between initial and final ideal-sorts of Body-Image Concept and Movement Concept were similarly obtained.

The data were treated statistically to determine if there was a difference in Body-Image Concept and Movement Concept between the classes prior to and after instruction, to determine if changes in Body-Image Concept and Movement Concept occurred within the two classes from the beginning of instruction to the end, to determine the amount of change of the real-self and the ideal-self components of Body-Image Concept and Movement Concept within each class, to determine if there was a difference in the amount of change in the self-sorts and ideal-sorts of Body-Image Concept and Movement Concept between the two classes, and to determine if there was a difference between the classes in the free-exercise routine competencies acquired by the end of the instructional period.

A series of null hypotheses were formulated regarding differences between and within classes. Analysis of covariance and Fisher's "t" test for significance of difference between correlated and uncorrelated means were the statistical methods used.

The following results were obtained:

1. There was no significant difference between the Body-Image Concept scores or the Movement Concept scores of Group I and those of Group II prior to seven weeks of instruction.
2. There was no significant difference between the Body-Image Concept scores or the Movement Concept scores of Group I and those of Group II after seven weeks of instruction.
3. There was no significant difference between the Body-Image Concept scores or the Movement Concept scores prior to and after seven weeks of instruction in Group I.
4. There was no significant difference between the Body-Image Concept scores or the Movement Concept scores prior to and after seven weeks of instruction in Group II.
5. There was no significant difference between the Body-Image Concept scores and Movement Concept scores prior and after seven weeks of instruction for all subjects.
6. There was a significant difference between the initial and final self-sorts of both the Body-Image Concept and Movement Concept in Group I.

7. There was a significant difference between the initial and final self-sorts of both the Body-Image Concept and Movement Concept in Group II.
8. There was a significant difference between the initial and final ideal-sorts of both the Body-Image Concept and Movement Concept in Group I.
9. There was a significant difference between the initial and final ideal-sorts of both the Body-Image Concept and Movement Concept in Group II.
10. There was no significant difference with regard to change in self-sort of the Body-Image Concept or the Movement Concept between Group I and Group II.
11. There was no significant difference with regard to change in ideal-sort of the Body-Image Concept or the Movement Concept between Group I and Group II.
12. There was no significant difference between change in self-sort and change in ideal-sort from initial to final Body-Image Concept and Movement Concept within Group I.
13. There was no significant difference between change in self-sort and change in ideal-sort from initial to final Body-Image Concept and Movement Concept within Group II.
14. There was no significant difference between Group I and Group II with regard to final competency in free-exercise routine performance.

On the basis of the statistical results the following conclusions were drawn:

Although seven weeks of instruction did not effect any change in the real-self:ideal-self discrepancy of the Body-Image Concept or the Movement Concept, both the problem-solving approach and the demonstration-explanation approach to gymnastics free-exercise resulted in the subject's re-evaluation of the ideal Body-Image Concept and ideal Movement Concept and a corresponding reassessment of the real-self in relation to the changed ideal.

The problem-solving approach and the demonstration-explanation approach to gymnastics free-exercise resulted in similar re-evaluation of the real-self and ideal-self in terms of the Body-Image Concept and Movement Concept.

Both the problem-solving approach and the demonstration-explanation approach resulted in the subject reassessing the real-self to the same degree that she altered the ideal-self, suggesting that an individual may seek to maintain the stability of her concept of her body and its capacity for movement within the total concept of her self.

The problem-solving approach and the demonstration-explanation approach resulted in similar competencies in terms of free-exercise routine performance.

In conclusion, this study revealed comparable effects of a problem-solving approach and a demonstration-explanation approach on both the final competency in free-exercise performance and the attitudes about one's body and its movement capacities.

Whether the student changes her ideal view of "self" because of exposure to high standard of performance in a demonstration or because of the challenge to solve a problem creatively, will probably depend upon the types of student-student and student-teacher interaction that occur during the educative process. Teaching methodology is only one variable in determining the type of interaction that occurs in any class. Other factors that may influence the interaction in the learning situation may merit investigation.

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APPENDICES

APPENDIX A

Gymnastics Skills Test and Rating Scale

GYMNASTICS SKILLS TEST

RATING CRITERIA

Excellent (4 points)	Performance with no spotting. Execution with no form faults. Complete amplitude. Continuity-smooth continuous movement. Lightness of execution and balance throughout.
Good (3 points)	Performance with no spotting. Execution with small form faults.** Slight lack of amplitude in torso. Continuity-slight break in rhythm of movement. Lightness of execution and balance throughout.
Fair (2 points)	Performance with light spotting. Execution with medium form faults.** Insufficient amplitude in torso, arms, and legs. Continuity-slight breaks in rhythm of movement. Noise upon landing and small movements of arms, torso, or legs to maintain balance.
Poor (1 point)	Performance with heavy spotting. Execution with large form faults.** Total lack of amplitude. Lack of continuity-jerky movement. Heavy landing and large movements of arms, legs, and torso - or need of supplementary supports to maintain balance.

**Form Faults

Small - Failure to point toes
Slight bending of arms and legs
Slight separation of legs

Medium - Considerable bending of arms or legs (about 45°)
Considerable separation of legs (shoulder width)

Large - Extreme bending of arms or legs (over 45°)
Extreme separation of legs (beyond shoulder width)

RATING SCALE

Subject Number	Forward Roll	Backward Roll	Headstand	Hitchkick	Cartwheel

APPENDIX B

Q-Sort Statements Body-Image

Q-SORT STATEMENTS BODY-IMAGE

1. I am good looking.
2. I enjoy having my picture taken.
3. I feel uneasy when I sit facing a group.
4. Heels make my legs look better.
5. I usually wear flat heeled shoes.
6. I am particular about the length of my skirts and dresses.
7. I am sophisticated.
8. People notice me when I enter a room.
9. I often notice people staring at me.
10. I enjoy looking at myself in the mirror.
11. Being well dressed is important to me.
12. I can appear sophisticated when I want to.
13. I dislike fat people.
14. I inherited my body build and therefore cannot do much about the way I look.
15. I enjoy being a girl.
16. I am concerned about the shape of my legs.
17. I get upset when my face breaks out.
18. I feel sorry for people who are homely.
19. My complexion has never been a problem.
20. Having a clear complexion is important to me.
21. I feel sorry for the girl who has a skin problem.
22. Physical activity is important to me.
23. My shoulders are broad.
24. I have good posture.
25. I feel most comfortable doing small restricted movements.
26. I am poised.
27. I am muscular.
28. I feel good in the clothes I wear.
29. I often wished I looked like someone else.
30. My physical appearance bothers me.
31. I often think about how I appear to others.
32. I look like an average person.
33. I wish I could wear the kind of clothes other girls wear.
34. I like to wear tight fitting clothes.
35. I wish I could do something about my size.
36. I am ashamed of my appearance.
37. I have big feet.
38. It is important for me to know I am physically attractive.
39. Weight control is difficult for me.
40. I think a lot about my physical appearance.
41. I am underweight.
42. I have nice teeth.
43. I have skinny arms.
44. I usually weigh more than I think I do.
45. I like to dress up because it gives me a good feeling.
46. My hair has always been a problem to me.
47. My hands are strong.

48. I have thick ankles.
49. I have expressive eyes.
50. My smile is warm and friendly.
51. I am sensitive about my size.
52. I am awkward.
53. I am well proportioned physically.
54. I spend a great deal of time on personal grooming.
55. Comments made in a group about physical appearance usually bother me.
56. I like to be told how I look.
57. I really don't care how I look.
58. I usually wear tight fitting sweaters.
59. I rarely think about my body.
60. I look good in shorts.
61. I feel fat.
62. I am too tall.
63. I have heavy thighs.
64. I look good in a bathing suit.
65. I like to talk about my appearance.
66. People are judged by their physical appearance.
67. I have ugly legs.
68. I have skinny legs.
69. My physical size makes me stand out.
70. I have big hips.
71. I like to learn about my body.
72. I am satisfied with the way I look.
73. I have small muscles.
74. I have big bones.
75. I am physically attractive.

APPENDIX C

Q-Sort Statements Movement-Concept

Q-SORT STATEMENTS MOVEMENT-CONCEPT

1. I am able to push a heavy object (like a piano) without difficulty.
2. My movements are described as slow.
3. Hanging by my arms is difficult for me.
4. I cannot keep up with the class when we do sit-ups.
5. Fine movements (like typing) are difficult for me.
6. Modern dance scares me.
7. I have difficulty getting my arms and legs to work together when I swim.
8. I like to move to music.
9. I take average size steps when I walk.
10. I have difficulty with balance when standing on one leg.
11. I doubt my ability to make baskets when playing basketball.
12. I feel discouraged about my physical ability.
13. I like to do stretching type exercises.
14. I try to get out of physical activity.
15. I have stiff joints.
16. Physical activity has always been important to me.
17. I feel hopeless when playing a game.
18. I am afraid to swim in deep water.
19. I fatigue easily.
20. I judge my physical performance by the best players in the class.
21. I can move as well as anyone.
22. I feel adequate when playing volleyball.
23. I really don't move well.
24. Sports scare me.
25. I feel confident about being able to learn new physical activities.
26. I feel embarrassed when doing exercises.
27. I am able to do heavy physical work.
28. I prefer doing things with my hands.
29. I like difficult physical tasks.
30. Jumping is no problem for me.
31. Physical fitness is unimportant to me.
32. I learn physical skills easily.
33. I throw a ball with accuracy.
34. I am able to meet the physical demands of everyday living.
35. I can be described as an energetic person.
36. I like to do big sweeping movements.
37. I usually use the handrail when going down the stairs.
38. I have difficulty climbing up a rope.
39. I stumble a lot when walking.
40. I have no difficulty carrying a wooden chair.
41. I like to do flowing kinds of movements.
42. I have difficulty with exercises which require me to move my arms and legs at the same time.
43. I like to swim.
44. I have fun playing on a team.
45. I like people who are active.

46. I make strong physical demands on myself.
47. I feel good when I move.
48. I am usually not able to do as well as others on the team.
49. I am physically fit.
50. I am easily discouraged when learning new movements.
51. I have difficulty catching large objects.
52. I can bounce a ball with ease.
53. I am interested in knowing how I perform physically.
54. I am really a good player.
55. I drop things.
56. I have trouble remembering dance steps.
57. I feel awkward when carrying large objects.
58. I perform best when doing small coordinated movements.
59. I like sports where I play against one other person.
60. I usually lose at sports.
61. I bowl with ease.
62. Controlling the ball in bowling is no problem for me.
63. I am a good swimmer.
64. I am afraid of falling.
65. My movements are inhibited.
66. I am average in physical skill.
67. I like to do hard physical work.
68. I like to be active.
69. I frequently bump into things.
70. My movements are brisk and sharp.
71. I have no difficulty keeping time with the music when I dance.
72. I feel helpless when faced with a physical task.
73. I have always been proud of my physical ability.
74. Physical activity bothers me. I would rather do something else.
75. I am well coordinated.

APPENDIX D

Instruction Sheet

INSTRUCTION SHEET

You have in your possession the following materials:

1. A set of 75 statement cards.
2. A strip of cardboard with columns labeled 1 through 9.
3. A White Self-Sort answer sheet.
4. A Yellow Ideal-Sort answer sheet.
5. A pencil.

Please sort the 75 statement cards into 9 piles (under the 9 columns on the cardboard strip) according to the degree to which each statement characterizes you. The nine (9) columns on the cardboard strip represent a 9-point scale, with the left-hand side labeled "least like" you and the right-hand side labeled "most like" you.

You will see a red number in parentheses under each column. This number indicates the number of cards to be placed in that column. Therefore, looking in column 1, you will see that you are to place the 2 statement cards which you feel are "least like" you under that column; and looking in column 9, you will see that you are to place the 2 statements that are "most like" you in that column. You will then place the remaining statements into columns 2 through 8 (in the numbers indicated in red) according to the degree to which each statement characterizes you.

You will sort the statement cards twice. The first time, please sort the statements from the point of view of how you see yourself as a moving person at the exact moment in time.

After you have sorted all 75 cards into the 9 columns, please record the results on the WHITE SELF-SORT answer sheet. Each answer sheet is numbered 1 through 75, corresponding to the black numbers on each statement card. Record by writing the number of the column in which each statement card has been placed after each statement number on the answer sheet. When completed, you should have a column number written after each of the 75 numbers on the answer sheet.

After recording all of your answers from the first sort, collect your cards to do a second sorting. This time you will follow the same procedure to sort the statements from the point of view of how you would ideally like to be as a moving person. After completing the sorting, record your answers on the YELLOW IDEAL-SORT answer sheet.

If you need any assistance in following the procedure, please raise your hand.

APPENDIX E

Self-Sort Answer Sheet

SELF-SORT ANSWER SHEET

Name _____

1. ____	26. ____	51. ____
2. ____	27. ____	52. ____
3. ____	28. ____	53. ____
4. ____	29. ____	54. ____
5. ____	30. ____	55. ____
6. ____	31. ____	56. ____
7. ____	32. ____	57. ____
8. ____	33. ____	58. ____
9. ____	34. ____	59. ____
10. ____	35. ____	60. ____
11. ____	36. ____	61. ____
12. ____	37. ____	62. ____
13. ____	38. ____	63. ____
14. ____	39. ____	64. ____
15. ____	40. ____	65. ____
16. ____	41. ____	66. ____
17. ____	42. ____	67. ____
18. ____	43. ____	68. ____
19. ____	44. ____	69. ____
20. ____	45. ____	70. ____
21. ____	46. ____	71. ____
22. ____	47. ____	72. ____
23. ____	48. ____	73. ____
24. ____	49. ____	74. ____
25. ____	50. ____	75. ____

APPENDIX F

Ideal-Sort Answer Sheet

IDEAL-SORT ANSWER SHEET

Name _____

1. ____	26. ____	51. ____
2. ____	27. ____	52. ____
3. ____	28. ____	53. ____
4. ____	29. ____	54. ____
5. ____	30. ____	55. ____
6. ____	31. ____	56. ____
7. ____	32. ____	57. ____
8. ____	33. ____	58. ____
9. ____	34. ____	59. ____
10. ____	35. ____	60. ____
11. ____	36. ____	61. ____
12. ____	37. ____	62. ____
13. ____	38. ____	63. ____
14. ____	39. ____	64. ____
15. ____	40. ____	65. ____
16. ____	41. ____	66. ____
17. ____	42. ____	67. ____
18. ____	43. ____	68. ____
19. ____	44. ____	69. ____
20. ____	45. ____	70. ____
21. ____	46. ____	71. ____
22. ____	47. ____	72. ____
23. ____	48. ____	73. ____
24. ____	49. ____	74. ____
25. ____	50. ____	75. ____

APPENDIX G

Tabulation Sheet

TABULATION SHEET

NUMBER _____

MOVEMENT CONCEPT									
#	S	I	D	D^2	#	S	I	D	D^2
1					41				
2					42				
3					43				
4					44				
5					45				
6					46				
7					47				
8					48				
9					49				
10					50				
11					51				
12					52				
13					53				
14					54				
15					55				
16					56				
17					57				
18					58				
19					59				
20					60				
21					61				
22					62				
23					63				
24					64				
25					65				
26					66				
27					67				
28					68				
29					69				
30					70				
31					71				
32					72				
33					73				
34					74				
35					75				
36									
37									
38									
39									
40									
				D^2=					D^2=
				r =					r =

BODY-IMAGE CONCEPT									
#	S	I	D	D^2	#	S	I	D	D^2
1					41				
2					42				
3					43				
4					44				
5					45				
6					46				
7					47				
8					48				
9					49				
10					50				
11					51				
12					52				
13					53				
14					54				
15					55				
16					56				
17					57				
18					58				
19					59				
20					60				
21					61				
22					62				
23					63				
24					64				
25					65				
26					66				
27					67				
28					68				
29					69				
30					70				
31					71				
32					72				
33					73				
34					74				
35					75				
36									
37									
38									
39									
40									
				D^2=					D^2=
				r =					r =

APPENDIX H

Correlation Coefficients Between Self and Ideal-Self Sorts (Problem-Solving Class)

TABLE XIV

CORRELATION COEFFICIENTS BETWEEN SELF AND IDEAL-SELF SORTS (PROBLEM-SOLVING CLASS)

Subject number	Movement Concept		Body-Image Concept	
	Initial testing	Final testing	Initial testing	Final testing
1	.845	.578	.837	.770
2	.865	.905	.510	.920
3	.744	.724	.337	.270
4	.810	.859	.341	.675
5	.845	.810	.280	.270
6	.816	.787	.630	.735
7	.653	.770	.749	.735
8	.705	.824	.451	.748
9	.292	.270	.430	.250
10	.139	.975	.586	.389
11	.900	.986	.685	.832
12	.551	.530	.295	.428
13	.613	.595	.709	.650
14	.360	.670	.165	.270
15	.650	.714	.604	.665

APPENDIX I

Correlation Coefficients Between Self and Ideal-Self Sorts (Demonstration-Explanation Class)

TABLE XV

CORRELATION COEFFICIENTS BETWEEN SELF AND IDEAL-SELF SORTS (DEMONSTRATION-EXPLANATION CLASS)

Subject number	Movement Concept		Body-Image Concept	
	Initial testing	Final testing	Initial testing	Final testing
16	.912	.745	.645	.779
17	.885	.776	.373	.634
18	.938	.821	.679	.845
19	.718	.950	.670	.695
20	.770	.875	.862	.879
21	.275	.209	-.188	-.245
22	.155	.679	.449	.548
23	.310	.734	.623	.512
24	.645	.815	.158	.505
25	.714	.720	.369	.335
26	.675	.945	.710	.735
27	.773	.710	.229	.510
28	.885	.860	.514	.469
29	.850	.845	.593	.834
30	.408	.390	.510	.655

APPENDIX J

Correlation Coefficients Between Self Sorts from Initial to Final Testing (Problem-Solving Class)

TABLE XVI

CORRELATION COEFFICIENTS BETWEEN SELF SORTS FROM INITIAL TO FINAL TESTING (PROBLEM-SOLVING CLASS)

Subject number	Movement Concept statements	Body-Image Concept statements
1	.548	.821
2	.733	.701
3	.775	.822
4	.762	.695
5	.835	.605
6	.919	.850
7	.720	.801
8	.810	.709
9	.730	.748
10	-.040	.075
11	.755	.625
12	.530	.659
13	.975	.985
14	.822	.165
15	.808	.625

APPENDIX K

Correlation Coefficients Between Self Sorts from Initial to Final Testing (Demonstration-Explanation Class)

TABLE XVII

CORRELATION COEFFICIENTS BETWEEN SELF SORTS FROM INITIAL TO FINAL TESTING (DEMONSTRATION-EXPLANATION CLASS)

Subject number	Movement Concept statements	Body-Image Concept statements
16	.822	.678
17	.761	.810
18	.495	.448
19	.790	.820
20	-.110	.898
21	.750	.845
22	.542	.829
23	.428	.470
24	.770	.784
25	.770	.385
26	.665	.995
27	.739	.730
28	.890	.968
29	.985	.640
30	1.000	.570

APPENDIX L

Correlation Coefficients Between Ideal Sorts from Initial to Final Testing (Problem-Solving Class)

TABLE XVIII

CORRELATION COEFFICIENTS BETWEEN IDEAL SORTS FROM INITIAL TO FINAL TESTING (PROBLEM-SOLVING CLASS)

Subject number	Movement Concept statements	Body-Image Concept statements
1	.685	.835
2	.805	.860
3	.845	.730
4	.785	.683
5	.880	.780
6	.905	.862
7	.852	.850
8	.820	.820
9	.660	.818
10	-.072	-.028
11	.760	.655
12	.810	.758
13	1.000	.985
14	.892	.925
15	.735	.765

APPENDIX M

Correlation Coefficients Between Ideal Sorts from Initial to Final Testing (Demonstration-Explanation Class)

TABLE XIX

CORRELATION COEFFICIENTS BETWEEN IDEAL SORTS FROM INITIAL TO FINAL TESTING (DEMONSTRATION-EXPLANATION CLASS)

Subject number	Movement Concept statements	Body-Image Concept statements
16	.764	.753
17	.748	.790
18	.221	.605
19	.526	.719
20	-.111	.990
21	.885	.830
22	.600	.775
23	.345	.450
24	.730	.741
25	.795	.532
26	.739	.765
27	.735	.719
28	.885	.705
29	1.000	.705
30	1.000	.655

APPENDIX N

Lesson Plan Outlines
(Problem-Solving)

LESSON PLAN OUTLINES
(PROBLEM-SOLVING)

Lesson 1. Introduction

Class role and locker assignments.
General explanation of purpose and importance of the study and a brief resume of the experimental schedule for the semester.
Possible scheduling into groups according to student schedules.
Question-answer period.

Lesson 2. Viewing and discussion of gymnastics film.

General introduction to free-exercise and elementary composition principles: transition and continuity
amplitude of movement and floor pattern
variety
contrast
originality

Lesson 3. Administration of preliminary skills tests for grouping.

Lesson 4. Administration of preliminary skills tests for grouping.

Lesson 5. Administration of Movement Concept Q-sort.

Lesson 6. Administration of Body-Image Concept Q-sort.

Lesson 7 and 8. Theme: Locomotor Movements

A. Preliminary problems
   1. Move from black line to black line in any way you can think of.
   2. Repeat, but remain on feet at all times, on one foot.
   3. Repeat Number 2, staying in contact with floor as much as possible.
   4. Repeat Number 2, staying in air as much as possible.

B. Discussion of vocabulary applied to above solutions (walk, run, hop, skip, jump, slide, leap).

C. Problems (on task cards)
   1. Move from black line to black line utilizing any combination of 2 or more of the following: walk, run, hop, skip, jump, slide, leap.
      Sub-problem: Add one more of the above to the sequence. Vary your arm positions during the sequence.
   2. Move from line to line in an indirect path utilizing the same sequence as above.
      Sub-problem: Use a circular pathway.
      Use an angular pathway.
   3. Select either pathway from above and include at least one change in direction of movement during your sequence (leading with front, back or side of body).
   4. Include at least one change of base of support from your feet while continuing to move.
   5. Demonstrate a change in tempo and force during the sequence.
   6. Practice the sequence with attention to continuity of movement and amplitude.

Lesson 9. Theme: Locomotor Movements

A. Review of movement sequences developed in Lessons 7 and 8.

B. Demonstration of the various sequences accompanied by discussion of floor pattern, amplitude, transition and aesthetic form.

Lesson 10 and 11. Theme: Weight support and weight transfer

A. Discussion of vocabulary: center of gravity
horizontal
vertical
static balance
dynamic balance

B. Problems
   1. Support your weight in two different balanced positions with a high center of gravity, one with the torso vertical and the other with the torso horizontal.
      Sub-problem: Change each balance by changing the position of some non-supporting body part or parts.
   2. Repeat number 1 with a low center of gravity in each balance.
      Sub-problem: Change each balance by diminishing or increasing the base of support.

3. Support your weight in a different way on one body part; on two parts; on three parts, on four parts.
   Sub-problem: In each of the above supports change the relationship of the body parts supporting the weight.
4. Support your weight in an inverted position.
   Sub-problem: Change the relationship of non-supporting body parts while maintaining this inverted position.
5. Select any balanced position with a high center of gravity and while maintaining this balanced position move any body part or parts in a repeatable pattern.
   Sub-problem: Repeat balancing with a low center of gravity.
6. Assume any static balanced position and by changing your center of gravity transfer your weight to move into a different balanced position on a different base of support.
   Sub-problem: Change the level of the center of gravity in this transfer. Initiate and lead the motion with different parts of the body. Change the tempo of weight transfer.
7. Transfer your weight from feet momentarily to hands and back to feet again.
   Sub-problem: Extend your body during this transfer. Where are your hips when taking weight on hands? Does your head position affect your control? Transfer your weight from feet to hands and back to feet, one foot at a time. Transfer your weight from feet to hands and back to feet at a different place on the floor.

Lesson 12. Theme: <u>Weight support and weight transfer</u>

A. Sequence problem: Select any balanced position and initiate movement from this position to continuously transfer your weight to different bases of support moving to a point about 15 feet away. Utilize some of the movements accomplished in solutions to problems in Lessons 10 and 11. Show at least two changes of level. End in a static balanced position. Be able to repeat your sequence. Work for continuous movement and smooth transitions.

B. Discussion of balance (static and dynamic) and weight transfer.

Lesson 13, 14 and 15 Theme: Turns - locomotor and non-locomotor movements

A. Discussion of vocabulary: transverse plane
sagittal plane
frontal plane
symmetrical
asymmetrical

B. Problems:

1. Move by turning in each of the following planes: transverse, sagittal, and frontal (optional).
2. Turn in place in the transverse plane with a high center of gravity.
   Sub-problem: Find two variations of this turn by varying the position of arms in relation to the body and to one another. Change one of these turns by initiating and leading the turn with a different part of the body; another part.
3. Turn in place in the transverse plane with a low center of gravity.
   Sub-problem: Change the base of support and repeat. Vary the relationship of the non-supporting body parts as you turn.
4. Find ways to roll in three different directions.
   Sub-problem: Vary each of these three rolls by changing the relationship of body parts.
5. Find a way to roll symmetrically with legs together; with legs apart.
6. Find a way to roll asymmetrically with legs together; with legs apart.
7. Extend one or both legs during the roll.
8. Assume a balanced position and roll from that balance to another balanced position.
   Sub-problem: Balance on three body parts and roll to balance on three body parts. Balance on two body parts and roll to balance on two body parts. Balance on one body part and roll to balance on three body parts; two body parts; one body part.
9. Do two consecutive rolls that are the same. That are different.
10. Sequence problem: Travel from black line to black line including turning movements utilizing a high center of gravity and a low center of gravity. Include at least two consecutive rolls. Combine turns with any locomotor movements you desire. End in a balanced pose.

C. Discussion of posture and head position on turns, proper body lift, spotting (focus) when turning,

and utilization of momentum when turning in the various planes.

Lesson 16, 17 and 18. Theme: Flight

A. Discussion of vocabulary: flexion
extension
momentum
absorption of force

B. Problems:

1. Obtain flight in the following directions: vertically upward; horizontal distance. How does body lean on the takeoff affect the direction of flight?
2. Obtain flight in the following ways: a 2 foot takeoff to a 2 foot landing; a 2 foot takeoff to a 1 foot landing; a 1 foot takeoff to a 2 foot landing; a 1 foot takeoff to a 1 foot landing on the takeoff foot, on the other foot.
3. Choose one flight pattern from Number 2 and vary it by changing the arm positions three different ways.
4. Vary the position of legs in the air as follows: both legs flexed at knee; both legs extended at knee; one leg flexed and the other extended at knee; legs together; legs apart.
5. Can you lead with one foot to the other by leading with a knee?
6. Can you turn while in the air?
   Sub-problem: Utilizing a 2 foot takeoff and a 2 foot landing, execute a ¼ turn; a ½ turn; a 3/4 turn; a full turn. Where are your arms while turning?

   Utilizing a 1 foot takeoff and a 1 foot landing, execute a ½ turn landing on the takeoff foot; on the other foot. Vary the position of the legs during flight (flexed, extended, together, apart, etc.).
7. Choose a jump or leap that will carry you horizontally and immediately upon landing tuck and roll to any balanced position.
8. From the above balanced position roll and immediately go into a vertical jump or leap from the roll. Which way must you lean from your roll to be able to get enough momentum to obtain flight?
   Sub-problem: Upon landing keep your movement going with any locomotor movements that will take you to a point 10 feet away. Include at least one change in direction.

9. Combine solutions to Numbers 7 and 8 to form a sequence. Practice and be able to repeat. Concentrate on height in flight and lightness upon landing.

C. Discussion of mechanics of takeoff and landing and posture in flight. Utilization of momentum to obtain flight and body control upon landing.

Lesson 19 and 20. Review

Put movement sequences together to form a full routine.
Add or change any movements. Practice routine working for amplitude, continuity, variety and aesthetic form.

Lesson 21. Second administration of Movement Concept Q-sort.

Lesson 22. Second administration of Body-Image Concept Q-sort.

Lesson 23 and 24. Free-exercise routine evaluation.

APPENDIX O

Lesson Plan Outlines
(Demonstration-Explanation)

LESSON PLAN OUTLINES
(DEMONSTRATION-EXPLANATION)

Lesson 1. Introduction

Class role and locker assignments.
General explanation of purpose and importance of the study and a brief resume of the experimental schedule for the semester.
Possible scheduling into groups according to student schedules.
Question-answer period.

Lesson 2. Viewing and discussion of gymnastics film.
General introduction to free-exercise and elementary composition principles: transition and continuity
amplitude of movement and floor pattern
variety
contrast
originality

Lesson 3. Administration of preliminary skills tests for grouping.

Lesson 4. Administration of preliminary skills tests for grouping.

Lesson 5. Administration of Movement Concept Q-sort.

Lesson 6. Administration of Body-Image Concept Q-sort.

Lesson 7. Skills instruction
Forward roll
Lunge forward roll
Lunge forward roll, arabesque leap
Demonstration and explanation of the performance and spotting for each skill followed by class practice in two's as teacher moves throughout the class giving learning cues.

Lesson 8. Review of previous skills in mass.
Skills instruction
Backward roll
Backward roll to knees
Backward roll to knees from support on one leg.
Cartwheel

Lesson 9. Review of rolls and cartwheel
Skills instruction
Hitchkick
Catleap
Tripod
Headstand

Lesson 10. Review of headstand

Skills instruction
Headstand roll down
(Optional) Handstand with spotting
Handstand roll down

Lesson 11. Review of headstand roll down and handstand roll down.
Demonstration of entire routine.
Demonstration of first sequence of routine.
Class observes and then tries the first sequence in mass with teacher in front.
Questions
Class practices first sequence individually as teacher moves throughout.

Lesson 12 and 13. Review of first sequence in mass.
Demonstration of second sequence.
Class observes and then tries second sequence in mass.
Questions
Individual practice

Lesson 14 and 15. Review of first and second sequences in mass.
Demonstration of third sequence
Same procedures followed as in the previous lessons.

Lesson 16 and 17. Review of first, second, and third sequences in mass.
Demonstration of fourth sequence.
Same procedures followed as in the previous lessons.

Lesson 18. Review of routine through the fourth sequence in mass.
Individual practice of routine through fourth sequence.

Lesson 19. Review of routine through the fourth sequence in mass, with student leader.
Demonstration of fifth sequence, followed by same procedures as in previous classes.

Lesson 20. Review of entire routine in mass.
Individual practice of routine with attention to amplitude, transition, continuity and aesthetic form.

Lesson 21. Second administration of Movement Concept Q-sort.

Lesson 22. Second administration of Body-Image Concept Q-sort.

Lesson 23 and 24. Evaluation of free-exercise routines.

APPENDIX P

Free-Exercise Judging Form

FREE-EXERCISE JUDGING FORM

Number _____

	Value	Deduction	Score
Continuity and transition	3		
Amplitude	2		
Execution	3		
General impression	2		
Totals	10	____	____

Deductions

APPENDIX Q

Free-Exercise Routine Performance Scores for Both Experimental Classes

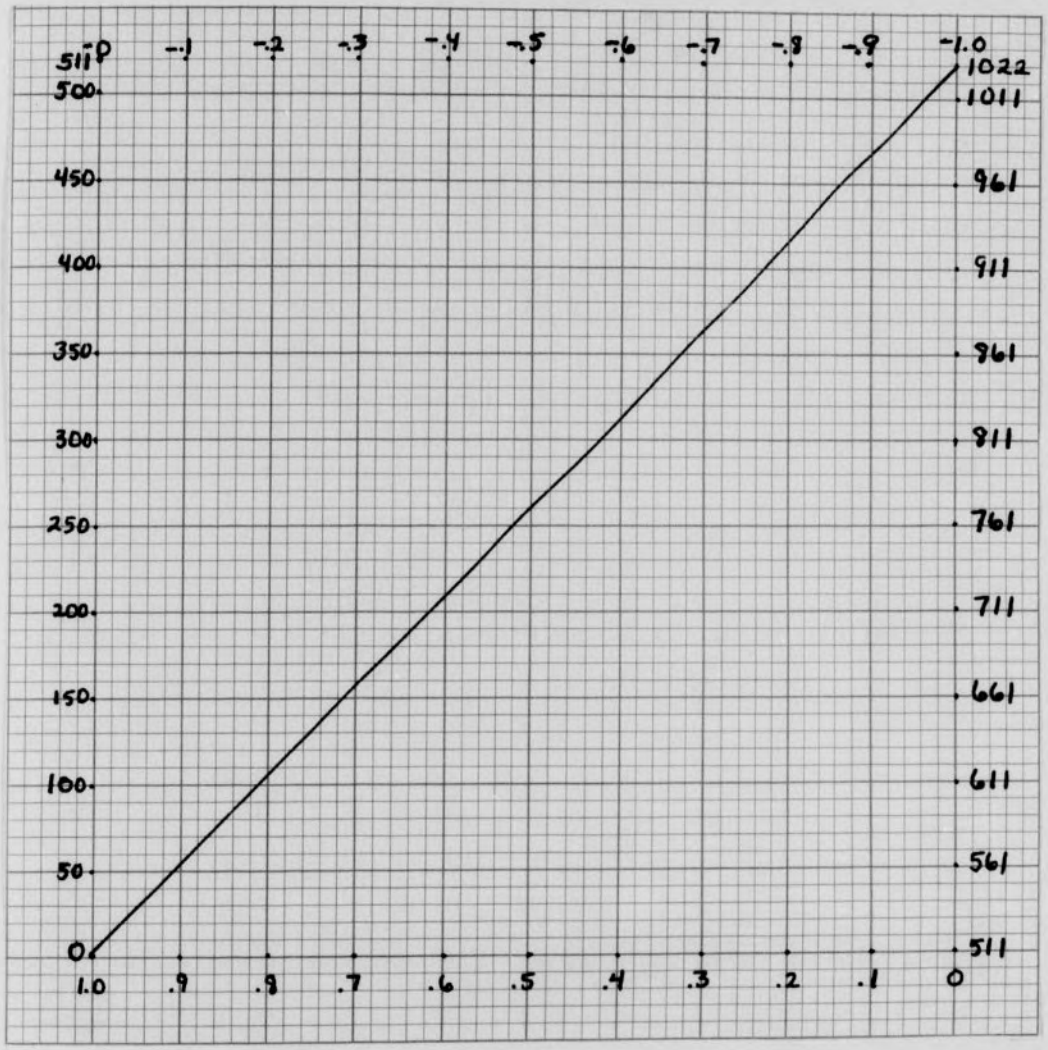
TABLE XX

FREE-EXERCISE ROUTINE PERFORMANCE SCORES
FOR BOTH EXPERIMENTAL CLASSES

Subject number	Problem-Solving class	Subject number	Demonstration-explanation class
1	6.4	16	4.5
2	5.0	17	9.0
3	3.2	18	10.0
4	7.0	19	4.8
5	8.2	20	3.0
6	9.3	21	3.9
7	10.0	22	10.0
8	6.4	23	6.4
9	4.0	24	6.6
10	4.5	25	9.1
11	3.0	26	4.2
12	8.3	27	5.0
13	4.0	28	9.3
14	9.0	29	3.8
15	7.8	30	6.7

APPENDIX R

Nomograph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-.5
-.6
-.7
-.8
-.9
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400
350
300
250
200
150
100
50
0
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1011
961
911
861
811
761
711
661
611
561
511
1.0
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.5
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.3
.2
.1
0

NOMOGRAPH